American Aviation

MANAGEMENT
ENGINEERING
PRODUCTION
OPERATIONS
MAINTENANCE
EQUIPMENT

RECEIVED
12 DEC 1953
ARMY Library
SERIAL RECORDS

FEB. 16

19 PROGRESS 50th Anniversary FLIGHT AND SECURITY 53

Interview with W. A. Patterson, President, United Air Lines . 16

Defense Obligations for Aircraft 11

★

Best Investment: Airplanes or Plants? 15

★

Latest Russian Developments 24

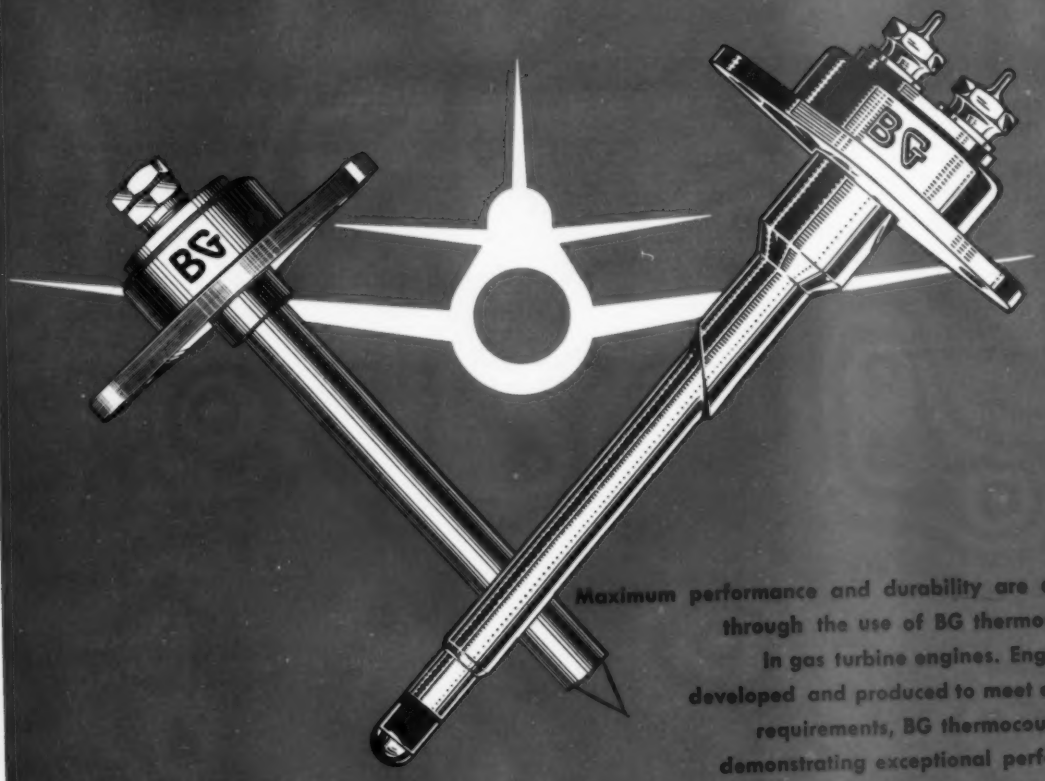
COPY

The VC-7: A Comet Replacement? 75

★

35 cents

Performance by BG

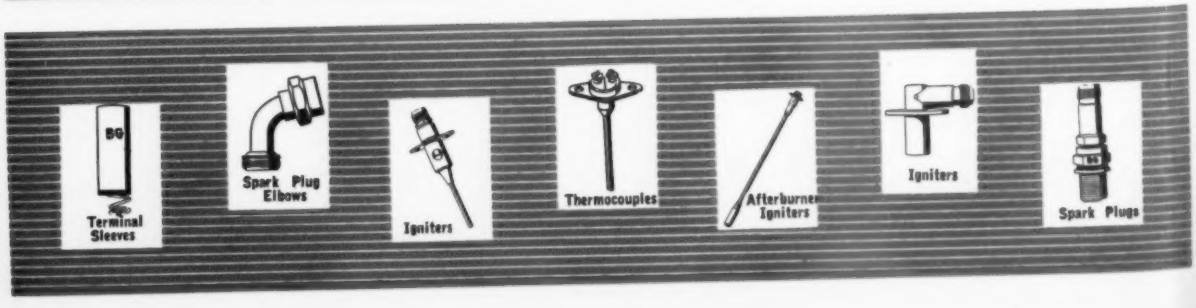


Maximum performance and durability are assured through the use of BG thermocouples in gas turbine engines. Engineered, developed and produced to meet exacting requirements, BG thermocouples are demonstrating exceptional performance in military aircraft — further evidence that in aviation products there is no substitute for BG quality.

For information on these and other BG products write to

THE BG CORPORATION

136 West 52nd Street
New York 19, N. Y.



Germany's Lufthansa may get going this summer. Under new U. S. administration, prospects seem better for prompt ratification of contractual agreements, establishing legal basis for German air operations.

This is one reason why U.S. and British manufacturers are giving big push to efforts to corner German transport plane market. And at least one U.S. airline (Pan American) is watching German developments closely. It may sell or lease some Convairs to Lufthansa.

•

Growing feeling in airline circles is that the ideal cargo aircraft will not be a new type plane, but rather a fully depreciated postwar model, like the DC-6 or Constellation. There's little chance of getting rates down to tap new markets as long as depreciation charges are high.

Example: Slick Airways' overall DC-6A operating cost was only about 1¢ per ton-mile less than the C-46's during year ended last June 30 (differential may be slightly more now with recent increase in C-46 operating cost). Reason: C-46's are almost fully depreciated.

•

End of wage, price, and materials controls will mean aircraft industry can return to free collective bargaining in labor negotiations.

As far as production is concerned, military planes won't be affected. Although Controlled Materials Plan ends, standby controls will insure defense output. It remains to be seen if commercial plane production will be protected against possible steel, copper, and aluminum shortages.

Priorities probably will continue on scarce metals such as nickel, tungsten, columbium, etc. And some method is likely to be proposed to earmark critical machine tools for aircraft production.

•

There's talk that Korean airlift may be revised. One proposal in military circles has been that AF's 37 C-54's now leased to carriers be recalled and assigned to lift (operated by airlines) with equal number of company-owned planes being withdrawn. Some officers think this plan would be cheaper.

It might meet with approval of some carriers, who could use returned DC-4's for coach and cargo service.

•

More states are considering aviation gas taxes. Airlines are watching the trend. **Tax proposals have been made** in Wisconsin, California (which would also hit aircraft manufacturers), and Tennessee. There's been talk in Kansas, Missouri, and other states. With cost of government increasing, states are looking for more income.

•

British will push military plane sales in Latin America as part of export drive. Society of British Aircraft Constructors put "the Americas" at top of list of areas okayed for export.

Watch for a British drive to sell commercial Comet III's and Viscounts in U.S. Their team of Air Registration Board experts, here to consult with CAA on certification of British jets in U. S., left no doubt about increased activity in this field.

•

New Air Force plan involving civil overhaul agencies will divide up engine work. It will be "single source" system—one company will overhaul a specific type of engine, another firm will handle another, etc. Plan must await new funds.

The Washington View

The Brass Line-Up

Washington observers are taking note of the number of Navy men who have infiltrated the ranks of the Defense Department's top secretariat. Of those now serving or expected to serve in the secretariat, six have former Navy connections out of a total of nine who have had any previous service affiliation. Two of the Navy men, incidentally, are in the Air Force secretariat—Robert C. Sprague, who has not yet been nominated but who is expected to be Under Secretary, and H. Lee White, who has been nominated and approved for Assistant Secretary.

Sprague has been getting indoctrinated in the Pentagon, but mysteriously has not yet been nominated, although the Under Secretary posts in the Army and the Navy have been filled. Air Force Secretary Talbott hinted at a possible reason—Sprague may not be able to satisfy the Senate on its stock divestiture requirements. He has resigned as president of Sprague Electric Co., but the company is family-owned. If the Senate insists on the stock divestiture requirements, Sprague may not accept the nomination.

The current line-up of the secretariat includes two holdovers from the former Administration—Assistant Secretary of Defense W. J. McNeil and Assistant Secretary of the Navy for Air John F. Floberg, both of whom are expected to remain in those jobs for at least a few months. Their continuance was in line with recommendations made by ex-Defense Secretary Lovett, who also recommended that Under Secretary of the Air Force Roswell L. Gilpatric be kept on. Gilpatric apparently did not care to stay.

At deadline, there were still five posts in the secretariat to be filled, including the AF Under Secretary assignment which Sprague is slated to fill, barring Senate confirmation difficulties. Assistant Secretary of the Air Force Edwin V. Huggins is still at his desk but Westinghouse Electric Corp. has already announced that he plans to return there as a vice president.

White House Favor and CAB Splits

Two CAB developments are causing talk and speculation:

• **Member Chan Gurney** getting the nod for a White House visit with President Eisenhower last week instead of Chairman Oswald Ryan.

• **The Republican-Democratic split** on the Board over opening several cases involving competitive services, particularly for American Airlines.

The first development — an apparent switch in White House favor between the two Republican Board members—could lead to an unbalancing of the already uneasy political split on the Board. Gurney may now be the strong man. The President asked him detailed questions on CAB operations, but there was no discussion of any candidates for the Board.

Gurney is serving under a Truman recess appointment for a six-year term and has been assured the appointment will stand. His nomination is pending Senate confirmation, and will be heard together with the forthcoming nomination for the now-vacant fifth CAB post.

The second development has caused several blow-ups at private CAB meetings. Democrats Josh Lee and Joseph Adams feel the need for competitive services, particularly for AA in the southwest, compel CAB to look into several route applications. Republicans Ryan and Gurney are for holding the line. Procedural steps have started in two cases; Cleveland-New York non-stop proceeding, and 12 applications (some dating back to 1943) for New York-Chicago area service.

Nothing has been done yet on the third one, involving applications to link the southwest with the west coast and the northeast seaboard. It could be the biggest domestic route case in years, and its start would be a big Lee-Adams victory.

Outgoing Tide

One of the early CAA casualties as a result of the new Administration is bound to be the politically minded assistant to the administrator, Albert J. Forte. By a strong push from Senator Neely (D., W. Va.), Forte got his job when Del Rentzel was Administrator, and was retained by Charles Horne. He has been highly unpopular in many quarters. He likes to dabble in politics, do favors for friends, and has been ambitious to be Administrator. One of his jobs was to create good will for CAA in Congress. Right now he's far on the other side of the fence.

Docks Instead of Jets

Promise of Sen. Charles W. Tobey (R., N. H.), chairman of the Senate Commerce Committee, to begin a televised investigation into the Port of New York waterfront conditions this week precludes any prospects of an early inquiry into jet transport prototype-aircraft development. Although Tobey rated the latter question high in justifying $75,000 in probe funds to cover several fields, he personally has taken the helm of a seven-man subcommittee to investigate the more sensational racketeering on the nation's waterfronts and has prophesied that the total $75,000 allotment will prove to be insufficient.

TIME WAS when planes landed and took off on uncushioned "skids" or "sled-runners." Some early fliers even tried using bicycle wheels with single-tube bicycle tires cemented to the rims—with unfortunate results. Then Goodyear changed all that.

In 1909, Goodyear developed the first pneumatic aeroplane tire, of the type attached to the sled-runners of the Burgess-Wright biplane shown here. Harry Atwood, the pilot, made this report after his World's Record Long-Distance Cross-Country Flight from St. Louis to New York (15 days): "I was often obliged to land in rough, unfavorable places, but your 20 x 2 inch Wing tire gave me no trouble at all."

GOODYEAR AVIATION PRODUCTS

AVIATION 50th ANNIVERSARY GOODYEAR ONE OF THE PIONEERS

NOW more aircraft land on Goodyear tires, tubes, wheels and brakes than on any other kind.

From the fastest jets to the most famous airliners, from Beechcraft Bonanzas to giant B-50's—from special Cross-Wind Landing Wheels to caterpillar-type track gear for soft landing strips—Goodyear sets the standard wherever aircraft take to the air.

These are just a few of the many Goodyear Aviation Products which are serving aviation today. Goodyear has been contributing to aviation progress since 1909.

Goodyear, Aviation Products Division
Akron 16, Ohio or Los Angeles 54, California

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

World's Largest Aviation Publishers

American Aviation

SERVING THE INDUSTRY SINCE 1937
1025 Vermont Ave. N.W., Washington, D. C.

• • •

Editor and Publisher
Wayne W. Parrish

Executive Editor
Eric Bramley

Phone: Sterling 3-5400

Cable: AMERAV

Managing Editor
William D. Perreault

JAMES J. HAGGERTY, JR. .....*Military Editor*
JOSEPH S. MURPHY .....*Technical Editor*
WILLIAM V. HENZEY .....*Transport Editor*
ROBERT M. LOEBELSON ..*Manufacturing Editor*
PREBLE STAVER .....*Legislative Editor*
WALTER A. KILRAIN..*Copy & Production Editor*
KEITH SAUNDERS .....*News Analyst*
ANTHONY VANDYK .....*Internat'l Editor*
FRED S. HUNTER .....*West Coast Editor*
LOIS C. PHILMUS .....*Corporation Aircraft*
WALLACE I. LONGSTRETH .....*People*
RICHARD F. MCGRATH ....*Special Assignments*
DORIS ROWZEE .....*Airline Statistics*
R. G. WORCESTER .....*Consultant*
JEAN-MARIE RICHE .....*Paris Editor*
ROY PEARL .....*London Editor*

February 16, 1953 Vol. 16, No. 19

Defense Dollars for Aircraft 11
Airliner Mobilization Stymied .. 14
Standby Plants vs. Planes 15
Patterson Speaks His Mind 16
Potential Air Freight Growth ... 22
Latest on Russian Progress 24
Changing Military's Joint Chiefs 28
Showdown on Reversing Props .. 32
Wien, Northernmost Airline 50
BOAC's Comet Successor 75

THIS MADE NEWS: Year's safety record set by carriers . . . DME merchandising agreement set, p. 14 . . . UAL-CAB seating fight heads for the courts . . . New Bonanza shown . . . Hackney sets up headquarters in Washington, p. 21 . . . Rynel grew fast with corporate aircraft, p. 34 . . . Titanium: out of the lab, into production, p. 36 . . . Northrop punch hits the jackpot, p. 41 . . . ANDB building traffic control center . . . Flight engineers win pay boosts . . . Western Air Lines puts new DC-6B into service, p. 42 . . . Overhaul contract awarded to British firm . . . Utilization table, p. 46 . . . Airlines already pay user charges, says ATA . . . Convair shows designs, p. 52.

AMONG THE DEPARTMENTS: Editorial, p. 7 . . . Letters, p. 8 . . . Industry Spotlight, p. 9 . . . News Briefs, p. 13 . . . Extra Section, p. 46 . . . Maintenance Bulletin Board, p. 55 . . . Technical news, p. 61 . . . New Products, p. 63 . . . Airline Commentary, p. 69 . . . CAB news, p. 71 . . . People, p. 72 . . . International Report, p, 75 . . . Production Picture, p. 78 . . . The Bulletin Board (classified advertisements) . . . Advertisers Index, p. 83 . . . En Route, p. 84.

General Manager: Leonard Eiserer
Director of Advertising: Stephen R. Kent
Circulation Promotion Mgr.: Larry Brettner

American Aviation is published every other Monday by American Aviation Publications Inc., Washington, D. C. Printed at the Telegraph Press, Harrisburg, Pa. Subscription rates for United States, Canada, Mexico, Central and South American countries—$5.00 for 1 year; $8.00 for 2 years; $10.00 for 3 years. All other countries—$7.00 for 1 year; $12.00 for 2 years. Entered as Second-Class matter in Washington, D. C., and Harrisburg, Pa.

Change of Address: Send old address (exactly as it appears on mailing label of your copy of magazine) and new address, including zone number, if any, to 1025 Vermont N. W., Washington, D. C. Allow two weeks for change-over.

Publishing Corporation: American Aviation Publications, Inc., Wayne W. Parrish, president; Leonard Eiserer, vice-president and general manager; Albert H. Stackpole, Eric Bramley, vice presidents; E. J. Stackpole, Jr., secretary-treasurer.

American Aviation incorporates Airports and Air Carriers, Airports, Aviation Equipment, The American Pilot, Aviation Sales and Service, U. S. Aviation and American Airports. All rights to these names are reserved.

ADVERTISING OFFICES . . .

New York Office: Administration Building, LaGuardia Airport, New York, N. Y. Illinois 7-4100. Stephen R. Kent, director of advertising; A. B. Copeland, regional advertising manager.

West Coast Office: Park Central Building, 412 West Sixth St., Los Angeles 14, Calif. Trinity 7997. Fred S. Hunter, manager.

Chicago Office: 139 North Clark St., Chicago 2, Ill. Central 6-5804. Bruce L. McGregor, regional advertising manager.

Foreign Advertising Representative: United Kingdom—Pearl, Cooper, Ltd., 2-3 Norfolk St., Strand, London, W. C. 2, Tel. Temple Bar 8111/3.

OTHER PUBLICATIONS . . .

American Aviation Daily, a daily news service for the entire industry. $200 per year. Managing Editor: Keith Saunders.

American Aviation Directory; twice yearly listing of products, people and organizations. $7.50 each. Managing Editor: Marion E. Grambow.

Official Airline Guides: Monthly publication of airline schedules and fares. $11 per year in USA and countries belonging to Pan American Postal Union, including Spain and the Philippines. $12.50 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Parrish.

American Aviation Traffic News (incorporating Air Tariff Reports): Daily rates and tariff news. $150 per year. Managing Editor: Wallace I. Longstreth.

When & Where

Mar. 11-13—Indiana-Ohio Joint Agricultural Aviation Conference, Purdue Univ., W. Lafayette, Ind.

Mar. 13—Institute of the Aeronautical Sciences, 8th Annual Flight Propulsion Meeting, Carter Hotel, Cleveland, Ohio.

Mar. 17-20—ATA Chief Pilots Meeting, Chicago.

Mar. 22-27—Congress of Aviation Organizations, Municipal Auditorium, Kansas City, Mo. (includes Airport Operators Council and AAAE, Mar. 23-26).

Mar. 23-27—8th Western Metal Exposition, Pan-Pacific Auditorium, and Western Metal Congress, Statler Hotel, Los Angeles.

Mar. 25-27—SAE Production Forum, Statler Hotel, Cleveland, Ohio.

Mar. 26—ATA Public Affairs Committee, Annual Meeting, Kansas City, Mo.

Mar. 27—National Association of State Aviation Officials, Board of Directors Meeting, Kansas City.

Mar. 31-Apr. 2—1st International Magnesium Exposition, National Guard Armory, Washington, D. C.

Apr. 18-19—Air Force Association, California Wing Convention, Hotel Manor, San Diego, Calif.

Apr. 20-24—SAE, Aeronautic & Aircraft Engineering Display, & Aircraft Production Forum, Hotel Governor Clinton, New York.

May 11-13—IRE National Conference on Airborne Electronics, Dayton Biltmore Hotel, Dayton, Ohio

May 14-17—9th Annual Forum, American Helicopter Society, Mayflower Hotel, Washington, D. C.

May 18-22—5th National Materials Handling Exposition, Convention Hall, Philadelphia, Pa.

May 19-23—ATA Operations Conference (city and hotel to be announced).

May 19-23—Aviation Writers Association, Annual Convention, Dallas, Tex.

June 6—4th Annual Maintenance & Operations Clinic, Reading Aviation Service, Inc., Reading Municipal Airport, Pa.

June 7-12—SAE, Summer Meeting, Ambassador & Ritz Carlton Hotels, Atlantic City, N. J.

International

Feb. 23—IATA, Technical Committee's Administrative Panel, Montreal.

Feb. 24—ICAO, First Air Navigation Conference, Montreal.

Mar. 23—IATA, Medical Committee, 3rd Meeting, Estoril, Portugal.

Apr. 20—IATA, 6th Technical Conference, Puerto Rico.

June 16—ICAO Assembly, Brighton, England.

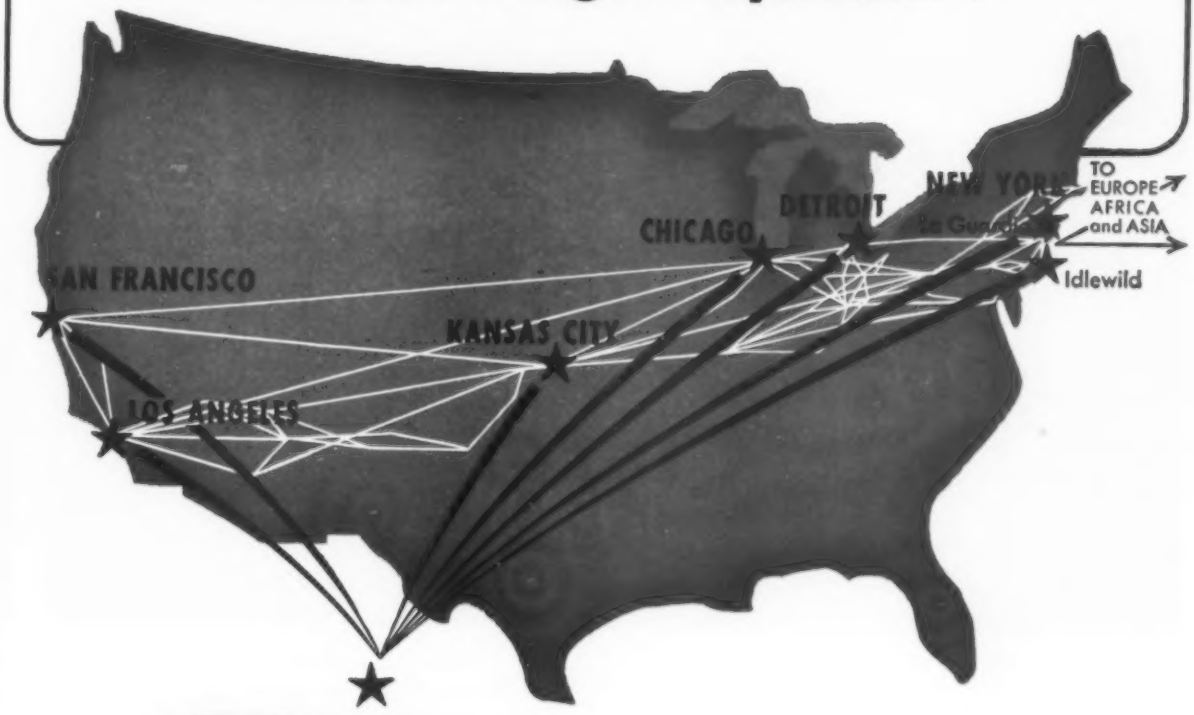
June 26-July 5—International Aircraft Engineering Convention, sponsored by French Aircraft Industries Assn., Paris.

Aug. 25—ICAO, Legal Committee, Rio de Janeiro.

Oct. 10—International Air Race, England to Christchurch, New Zealand.

TWA Selects CURTISS-WRIGHT

Electronic Flight Duplicators



Curtiss-Wright Electronic Flight Duplicator

Trans World Airlines has purchased Curtiss-Wright Electronic Flight Duplicators for the training of pilots at each of the major U.S. centers where its air crews are based. An international air carrier, TWA's far-flung routes reach from San Francisco and Los Angeles across the United States to Europe, Africa and Asia.

JOBS FOR: ENGINEERS
ACCOUNTANTS • TECHNICIANS

CURTISS-WRIGHT

CORPORATION • WOOD-RIDGE, N.J.

First in Electronic Flight Simulation

MONSANTO
CHEMICALS — PLASTICS
SERVING INDUSTRY . . . WHICH SERVES MANKIND

To protect its new fleet of million-dollar Douglas DC-6B's, Western has specified that all of them will carry fire-resistant Monsanto Skydrol* in the cabin superchargers. These new planes are for service on the Pacific Coast, and between California and Minnesota.

Western is the 15th major airline to adopt this safe, noncorrosive hydraulic fluid which is unique in its field.

Here's a digest of Skydrol's outstanding performance features:

Reg. U. S. Pat. Off.

SKYDROL IS . . .
. . . nontoxic
. . . noncorrosive
. . . stable at required operating temperatures and pressures
. . . fire-resistant

SKYDROL IS USED BY . . .
15 major airlines, domestic and foreign: American, United, National, Delta, Braniff, Western, Pan American, Panagra, Slick, Transocean, Swissair, LAI, CMA, PAL, KLM

SKYDROL HAS . . .
logged approximately one and one-half million hours aloft in cabin superchargers and 100,000 hours in hydraulic systems

SKYDROL HAS . . .
double the lubricity of conventional hydraulic fluids

SKYDROL . . .
extends the service life of pumps, cuts maintenance costs

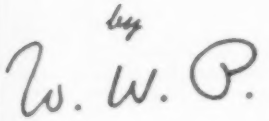
Skydrol is the only fire-resistant fluid which can be used in both cabin supercharger and hydraulic systems, as well as oleo struts. Ask for information on Monsanto's Pydraul* F-9, fire-resistant fluid for hydraulically operated industrial equipment.

THIS BOOK containing complete Skydrol specifications and test data, will be sent to airline officials or aircraft owners on request. Write MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 800 North Twelfth Blvd., St. Louis 1, Missouri.

Editorial

Jet Race Quickens

THE SPOTLIGHT on the international jet transport race has now shifted to the United States. One shaft of the spotlight is on Washington, where a British government civil aviation team is trying to come to terms with our own CAA jet study team on the certification of the de Havilland Comet and other jet transports. Another shaft of the spotlight is now directed to the far northwest of the United States on Boeing Airplane Company in Seattle.



In many quarters the cryptic announcement by Boeing last September that it is now engaged in building a prototype jet airplane of new design and would have that prototype flying by mid-1954 was not taken too seriously. At best it would be a makeshift out of the B-52, the B-47, and the C-97, the comment ran. Where would Boeing be able to obtain engines anyway, asked the skeptics, and besides the project was being rushed too rapidly to incorporate all of the then-fluid requirements of airlines.

It is now obvious that Boeing's Project X is anything but a hurried-up makeshift. Much preliminary work had already been done when the announcement was made. Project X is currently ahead of schedule. If all goes well it will actually be flying by the summer of 1954. Boeing has already solved more than one tough problem, financial and otherwise, involved in building and flying a prototype by that date. And just in recent weeks and months, Boeing has suddenly become a mecca for airline teams from all over.

What has now become clear is that Project X is a completely new design in every respect. Nothing of the other Boeing projects is being used. In seating capacity and general size it fills all known major airline requirements save one. And Boeing claims it is easily adaptable to military and tanker purposes. Airline visitors are not getting much in the way of performance data, certainly nothing in writing. Boeing decided to build a prototype which it feels meets as closely as possible the varied commercial requirements and then demonstrate the actual airplane.

Down the west coast in Southern California, Douglas and Lockheed, naturally, are not asleep. Both may be farther along than they will admit. But at this moment it looks as though Boeing will be first into the air.

Meantime the Comet certification problem will rage warm and hot for some time. Involved is the Pan American order for three Comet III's, to say nothing of the option which National is reliably reported to have on two Comet I's owned by Canadian Pacific Air Lines and which CPA will sell when it receives Comet II's. The major certification battle is certain to center on the location of the power plants. In the Comet the power plants are close in, a location which has been debated back and forth among aerodynamicists in both Britain and the United States.

The jet race won't die down. It will continue to get warmer. Competitive operations are involving U. S. airlines much earlier than they had wished for. The big show will center in the U. S., despite the praiseworthy lead and progress offered by the progressive de Havilland company of Britain.

Tell the Story

It strikes us as a mighty potent public relations weapon that the scheduled domestic airlines during 1952 paid an estimated $12,000,000 in Federal gasoline taxes.

To read the railroad ads these days you'd think that the railroads never received a penny of Federal assistance or subsidy but that the airlines (and all other forms of transport) were feeding at the public trough.

Right now there is talk of the government pressing for a "user charge"—an assessment against the airlines for the use of the Federal airways system. But isn't the gasoline tax provided for that very purpose? To add a user charge for the use of the airways system is not only contrary to the practice of providing public safety and traffic aids, but would accomplish nothing except more bookkeeping and jobs for petty bureaucrats, for it would have to be deducted from other Federal taxes. But when are the airlines going to let the public know their side of the story?

A Shrug at Safety

A British Avro York transport went down in the North Atlantic the other day with 39 passengers on board, the first such accident to mar the remarkably fine trans-Atlantic commercial safety record. It was operated by a British independent operator.

The York is a wartime makeshift evolved from the Lancaster bomber. Its record has been bad. It was never designed for peacetime over-ocean hops, especially in mid-winter. In the interest of wartime expediency its use could perhaps be justified. In peacetime commercial operations, its use is most questionable. In these days when reliable commercial airplanes are available, the use of the York on trans-Atlantic trips can only be described as ill-advised, if not indeed stupid.

. . . WAYNE W. PARRISH

Letters

Letters should be addressed to The Editor, American Aviation Magazine, 1025 Vermont Ave., N.W., Washington 5, D. C. Anonymous letters will not be printed, but names will be withheld upon request.

HELICOPTERS

To the Editor:

This is with reference to your January 5 editorial regarding Mr. William Littlewood's comments on the future role of the helicopter in air transportation. It is the considered opinion of the McDonnell Aircraft Corporation that compound helicopter transports can replace conventional transport airplanes for short-haul passenger carrying service. Development of the new types of high performance multi-engine rotary wing aircraft now under construction must first be completed and the prototype aircraft's reliability fully proven by extensive tests prior to scheduled airline operation.

The progress of the helicopter since its first flight in the USA in 1939 has been rapid. Experience accumulated will accelerate further development but time is required. The "inherent" mechanical complexity of [current models of] this type of "flying machine" is well recognized. However the next decade will bring high performance rotary wing aircraft of increased simplicity and improved reliability. Prototypes of high speed rotary wing transports are now under development for the military services. They will complement airline operations and should provide an attractive solution to the current critical air terminal time delay problem.

After extensive service tests, new type, high performance rotary wing transports should operate equally as reliably, economically and comfortably as fixed wing transport. They will provide the fastest transportation services for the short haul of passengers, mail, and cargo. They should prove attractive and profitable aircraft for the airlines as they can reduce the number of types of aircraft required for airline services.

High performance rotary wing transports operating from a number of strategically located low cost heliports can relieve the schedule saturation now developing at the major metropolitan airports.

The helicopter is a new form of air transportation. Because of its ability to readily make the transition from high to low speed or vice versa, proven multi-engine rotary wing aircraft will not be restricted by the limitations of fixed wing transports. Rotary wing transports will fly with a minimum of vibration and noise and can adjust their operating speeds and altitude to conform with any condition of weather or surface (terrain).

Utilizing the more complete weather information planned for the future and the more efficient navigational aids, they will be able to operate under lesser visibility and ceiling conditions than conventional transport aircraft. They will have superior crash tolerance to that of any known vehicle because of their ability to land, except under extreme emergency conditions, with a minimum of energy. It is entirely possible that rotary wing aircraft may be the only usable transportation should a catastrophe isolate a metropolitan area.

The McDonnell Aircraft Corporation pioneered the development of the twin engine transport helicopter. The Navy XHJD-1, the world's first twin engine helicopter, was capable of continuing flight on one engine with full gross load of 11,000 lbs. The extensive flight tests program, 1946 to 1950, confirmed the desirability of multi-engine safety for air operations and established the potential operational requirement for large, multi-engine rotary wing aircraft. Subsequent engineering studies resulted in armed service contracts for the development of new type, high performance, multi-engine rotary wing aircraft.

Rotary wing transports can and will replace conventional transport airplanes for short haul air services as soon as fully proven models of the new types are available for commercial operations. The full potential of the helicopter cannot be established until the above aircraft are available for actual operational tests.

J. S. McDONNELL

President
McDonnell Aircraft Corporation
Post Office Box 516
St. Louis 3, Missouri

•

To the Editor:

I have reviewed the editorial in AMERICAN AVIATION of January 5 with considerable interest.

It is agreed that the helicopter was completely oversold and overrated following the end of World War II. It is our opinion that this flood of Sunday-magazine type of articles concerning the helicopter for every man's backyard has been of little value to the helicopter industry, and has probably hindered the commercial progress to some extent.

We feel that the passenger carrying helicopters over conjected areas is a problem that must be approached very cautiously. The reliability of the power plant and the power transmission systems, as well as all control systems, must be definitely established before operation over congested areas can be justified.

Mr. Littlewood's comment concerning the mechanical complexity of the helicopter reminds me of a report which I reviewed which was written in 1903 concerning the future possibilities of the automobile. The report was prepared by a consulting engineer for the purpose of determining whether a prominent corporation should enter the automotive field. This consulting engineer, after considerable study, had two conclusions:

• The automobile was such a complicated piece of machinery that it would be impossible for any person, except an experienced mechanic, to operate the machine.

• Even in the event that these mechanical problems were solved, we still would not have a highway system to support the machine for large quantity mass production.

The mechanical problems that seemed impossible 50 years ago are today, after the expenditure of billions of dollars on mechanical development, very simple. In a like manner, it is my personal opinion that 50 years from today the mechanical problems, the stability problems and the control problems with which our engineers are struggling today, will be solved and very simple to incorporate in the new models of helicopters.

If I were to try to predict the future of the helicopter, I would probably make an analysis of about the same accuracy as that of the consulting engineer in 1903 concerning the automobile.

In closing I would like to quote a statement which our president, Mr. Duane Wallace, made concerning our fixed wing aircraft. I believe this statement applies equally well to the helicopter developments of the company—"In our business it is early morning and the sun is shining."

CHARLES M. SEIBEL

Chief Engineer
Helicopter Division
Cessna Aircraft Company

•

To the Editor:

It is a pleasure to reply to Mr. William Littlewood with respect to "hard facts and helicopters." I would first point out that Mr. Littlewood's comments may help keep some of the things that are written about helicopters on the beam, but I am sure it will have little effect in the circles which are active in helicopter development.

One should at first recall that the helicopter was vastly over-sold by elements of the press in 1944-46. At that time, experienced engineers and most company managements were well aware that existing helicopters were "relatively expensive in operating costs per mile and fraught with problems of dependability." When these facts became evident to operators and would-be operators and to the military services, the helicopter was immediately black-balled and vastly underestimated. As a result one could find very little good being said of the helicopter in the period from 1947 to 1950.

However, during that period true development continued. Military procurement resulting from the Korean War was largely based upon old models, but some of these had had such

(*Please turn to page 80*)

Industry Spotlight

Decision has been made to install the first Bristol Olympus engines in the Avro Vulcan, a delta wing bomber, making it the most powerful of Britain's three long range jet bombers. The other two, Handley Page's Victor and the Vickers Valiant, have 8,300-pound-thrust Sapphires and 6,500-pound-thrust Avons, respectively. The Olympus is rated at well over 10,000 pounds thrust.

•

An improved version of the Boeing 502 geared turbine engine, rated at over 220 horsepower, is now under test in Seattle. Up more than 70 horsepower over the earlier models, the 502-10 has the same dimensions but has a larger compressor, bigger turbines, and weight is up a little. Added horsepower opens up many new possibilities for the versatile 502.

•

Boeing has outfitted a B-47 as a tanker, the KB-47, which would make it the first jet powered refueling plane. USAF, meanwhile, has abandoned plans for construction of the Douglas YKC-124B turboprop tanker. The regular turboprop C-124B remains in the program.

•

First of the C-119's using only Kaiser-Frazer-built or subcontracted parts has started down the production line at Willow Run. K-F's first 30 Flying Boxcars were to contain decreasing quantities of Fairchild-furnished parts and about 25 Kaiser C-119's have been completed. Meanwhile, first flight of the first production model of the Chase C-123 is due any day now.

•

Tiny submarine to be used to launch guided missiles which would operate in connection with a larger vessel, possibly the atomic-powered submarine Nautilus, is under development by Fairchild Engine and Airplane Corp's Long Island divisions.

•

Convair is expecting military orders for its commercial CV-340. First deliveries of the VT-29 to the USAF will take place soon. The military version of the Convair 240, featuring rearward facing seats, will be used to transport high AF brass. MATS is to get its first C-131A Samaritan air evacuation transports, also based on the CV-240, early next year.

•

Troop transport by helicopter, now a firm Army policy, is to get a further test by the Marine Corps at an airfield near Mojave, Calif., this week. The Marines, using 30 helicopters, will simulate night and pre-dawn mass troop assaults.

•

Rolls-Royce's Avon RA7 has been type tested at 7,500 pounds static thrust. Later models, such as the RA14 and RA16 now under development, will go up to 10,000 pounds or more.

•

Still undecided about producing its CL-21 twin-engine transport, Canadair is preparing a brochure on a military version in hopes that the RCAF or some foreign air force will help defray development costs by military orders. Canadair's final rule in the proposed production of Bristol Britannias for the RCAF may yet be the deciding factor in the future of the CL-21.

•

Titanium may make its appearance in helicopter rotor blades before very long as a replacement for stainless steel. Prewitt Aircraft has a contract to build and study advantages of titanium-alloy blades, including bonding qualities of the new metal. Prewitt's adhesively bonded steel rotor blades, to be used on the Piasecki HUP-2 starting in May, have successfully completed structural flight tests.

TECO 28 passenger

DC-3 and C-47 SEAT CONVERSION KITS!

Modernization of DC-3 type equipment to 28 passenger versions at a truly economical figure is providing worthwhile profits without extra operational costs!

It will pay you to investigate TECO's completely engineered 28-place kit offer which includes all specially designed luxury hi-density seats, floor channels, fasteners and floor structure modification data.

Partial interior view of Stewart Air Service, Hawthorne, California, DC-3 fully 28 passenger place equipped and CAA approved with TECO lightweight hi-density kit seats as shown above.

SEND INQUIRIES TO:

Dept K28, 2501 North Ontario St., Burbank, California.

manufactured by
TRANSPORT EQUIPMENT CO.
Burbank • California

REPRESENTED IN CANADA BY:
RAILWAY & POWER ENGINEERING CORPORATION LIMITED • 3745 St. James Street • Montreal 30, P. Q.

B.F.Goodrich

Sealed lips hold the secret of faster maintenance

LOCKHEED ENGINEERS were looking for a way to seal the gap between elevator and stabilizer on the P2V-5 "Neptune" for smoother operation of controls. A flap seal—long strip of coated fabric—would do the trick. But an ordinary flap seal poses a maintenance problem. Every time an elevator is taken off for service, the flap seal must be removed too. And with ordinary flap seals, that's a long, costly job.

So Lockheed engineers came to B. F. Goodrich with the problem. And B. F. Goodrich had the answer—the Pressure Sealing Zipper.

The zipper's overlapping rubber lips provide a 100% effective seal against pressure. As a result, the elevator controls are easier to operate. When an elevator is removed, mechanics simply unzip the seal instead of laboriously taking out one screw after another. If a new elevator is installed, old and new halves of the zipper mesh perfectly, since all halves of the zipper are interchangeable. And the zipper makes it easier to get a tight-fitting seal around the hump shown over the man's arm in the photo.

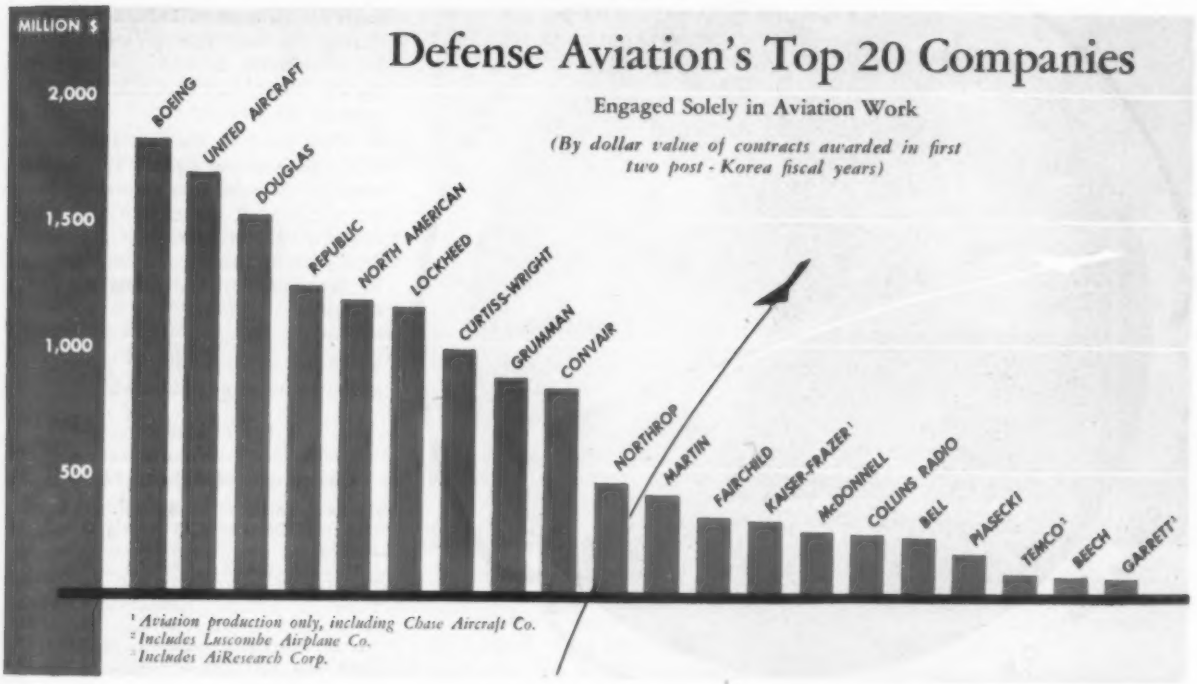
B. F. Goodrich Pressure Sealing Zippers can be cemented onto either fabric or metal. They save space and weight. Fit snugly around complex shapes. Are used on airplane doors, air ducts, inverter covers, watertight protective coverings. For information on construction and applications of Pressure Sealing Zippers, write for our new booklet, "Hold Everything." *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

B.F.Goodrich
FIRST IN RUBBER

ESTABLISHED JUNE 1, 1937

World's Largest Aviation Publishers
American Aviation

VOL. 16, NO. 19



Aviation: Lion's Share of Defense Dollars

Over half of prime contract money has gone to industry in last two years; five of big 10 firms are aero.

By James J. Haggerty, Jr.

SINCE THE START of the post-Korean expansion, it has been a well known fact that aviation production is a very big business, but just how big it has become is made clearer than ever in a new report issued by the Munitions Board.

The report, which lists the top 100 recipients of prime defense production contracts during the first two fiscal years following the start of the Korean war, shows that well over half of the all the defense production dollars in prime contracts are being spent for aviation equipment.

Moreover, of the top 10 companies, only two are not engaged in some form of aviation production. Five are working solely on aviation production while the other three are producing both aviation and non-aviation items.

The Munitions Board lists these other facts which point up the impact of aviation production on the sales of the nation's business firms:

- **Of the top 100 firms** receiving prime contracts, 38 are either wholly or partially engaged in aviation work.
- **Ten of the first 25** firms on the list are "old-line" aircraft industry firms which produce nothing but aviation products.
- **Of the slightly more** than $20 billion received by the top 10 defense producers, more than 60% went for aviation equipment.
- **Every major aircraft** industry company made the "first 100" list, plus a few minor companies.

The impact of defense production contracts has been such, the Munitions Board points out, that 12 of the "first 100" defense contractors are not even included in the Federal Trade Commission's pre-Korea ranking of the first 1,000 manufacturing firms in the country.

Twenty companies in the aircraft industry, that is, companies which are solely engaged in the manufacture of aviation products, were included in the top 100 list. Of this group, Boeing Airplane Co. was No. 1 on the list, having received $1,847,900,000 in prime contracts, or 2.6% of all the contractual money poured into the top 100 firms. United Aircraft Corp. placed second with $1,696,700,000 (2.4%), while Douglas Aircraft Corp. was third with $1,511,500,000 (2.2%).

Boeing, however, was not the top recipient of aviation contracts. General Motors Corp., which led the list of the

Big 10 in Defense Production

FISCAL YEARS 1951-52

AVIATION PRODUCTION 61.8%
BOEING 9.1%
UNITED AIRCRAFT 8.8%
DOUGLAS 7.5%
GENERAL ELECTRIC 7.4%
REPUBLIC 6.1%
NORTH AMERICAN 5.9%
FORD MOTOR CO.* 3.5%
GENERAL MOTORS* 13.5%
Includes Chrysler Corp. and American Locomotive Corp., which had no aviation orders, plus non-aviation orders to General Motors, General Electric and Ford.
NON-AVIATION PRODUCTION 38.2%

** Estimates - Aviation breakdown not available*

100, received $5,489,500,000 (7.8%) for all defense products (including tanks, trucks, etc.). It is estimated that one half of this volume will be channeled into aviation production.

Boeing placed fourth in the list of all defense contractors, behind GMC, General Electric, and Chrysler Corp. United Aircraft was fifth, Douglas sixth, Republic Aviation Corp. eighth, and North American Aviation 10th.

The dollar volumes indicated do not represent sales volume for the companies concerned; they are the total awarded in prime contracts, a large percentage of which (40% is the industry average) is doled out to subcontractors.

Boeing supplanted United Aircraft as the top aircraft industry contract recipient. In a previous Munitions Board report, which covered the first 18 months after the start of the Korean war, United Aircraft was second only to GMC. Boeing jumped from seventh to fourth place, General Electric moved from fifth to second, and Chrysler Corp. moved from eighth to third.

Two aviation companies now listed in the first 100 were not included in the list published six months ago: Borg-Warner Corp. and Temco Aircraft Corp. No manufacturers of aviation products dropped out of the first 100.

A comparison with the World War II ranking of the first 100 companies points up the fact that the "old-standbys" of the last war are not necessarily the top companies today. Twelve companies which manufacture aviation products and which are now in the first 100 were not on a similar list of the top suppliers of World War II. Northrop Aircraft jumped from No. 100 on the wartime list to No. 21 on the current list.

Most significant change in the top 10 was Republic Aviation Corp., which jumped from a wartime ranking of No. 24 to its current position as No. 8. Boeing jumped from 12th to fourth, while United Aircraft, Douglas, and North American retain approximately the same positions they held on the World War II list. Biggest drops were recorded by Curtiss-Wright Corp. (second to 13th) and Consolidated Vultee Aircraft Corp. (fourth to 16th).

The report shows that a total of $73,849,800,000 was awarded in contracts for all types of defense equipment during the two year period. Of this, $43,803,400,000, or 62.4%, went to the top 100 firms. More than $20,000,000,000 went to the top 10.

Not listed in the first 100, because it is a government agency and includes contracts awarded to a number of firms, was Canadian Commercial Corp., which received $199,410,000. CCA handles nearly all military contracts for work to be done by individual Canadian firms.

The following is a list of companies which are either wholly or partially engaged in aviation production:

Company	Dollar Volume (Millions)	Rank Now	Rank World War II
General Motors	5,489.5	1	1
General Electric	2,418.3	2	9
Boeing	1,847.9	4	12
United Aircraft	1,696.7	5	6
Douglas Aircraft	1,511.5	6	5
Ford	1,289.1	7	3
Republic	1,231.8	8	24
North American	1,186.1	10	11
Lockheed	1,157.3	11	10
Curtiss-Wright	990.0	13	2
Westinghouse	929.8	14	21
Grumman	861.6	15	22
Consolidated Vultee	820.1	16	4
Studebaker	747.8	17	28
Sperry	712.0	18	19
Bendix Aviation	683.0	19	17
Northrop	469.2	21	100
Hughes Tool Co. (inc. Hughes Aircraft)	426.1	22	*
Packard	407.0	24	18
The Glenn L. Martin Co.	404.5	26	14
Avco Manufacturing	385.7	28	32
Fairchild	310.4	32	73
Kaiser-Frazer (inc. Chase Aircraft)	303.5	33	*
Goodyear	292.6	34	30
McDonnell Aircraft	259.0	39	*
Collins Radio	253.3	40	*
Bell Aircraft	240.8	41	25
Continental Motors	224.7	48	38
Piasecki	180.2	52	*
General Tire & Rubber	145.8	64	*
Hazeltine	119.6	70	*
Borg-Warner	104.3	80	*
B. F. Goodrich	103.9	81	67
Minneapolis-Honeywell	101.9	82	*
Temco Aircraft Corp. (inc. Luscombe)	92.9	87	*
Beech Aircraft	90.6	88	69
Gilfillan Bros.	81.9	94	*
The Garrett Corp. (inc. AiResearch)	79.9	97	*

** Not included in WWII top 100 list.*

• • •

News Briefs

The key to the fast moving, high-altitude **"jet streams"** may have been found. Dr. Vincent J. Schaefer, General Electric Company scientist, has told the American Meteorological Society that weather stations can locate the wind currents by observing cloud formations.

• •

The possibility that **Congress may knot its purse-strings,** at least temporarily, is viewed by the aircraft industry with something less than enthusiasm, according to **Adm. DeWitt C. Ramsey,** president of Aircraft Industries Association. Ramsey has "noted with apprehension" the remarks of some Congressmen about possible limitations on expenditures for military aircraft during the coming fiscal year.

• •

Former vice president of Fairchild Engine and Aircraft Corp. **Myron B. Gordon** has been named president of **Flight Refueling, Inc.** Controlling interest in the firm was recently bought by a group consisting of Laurance S. Rockefeller, Reaction Motors, Inc., and associates.

• •

House of Representative members newly appointed to the **Joint Committee on Defense Production** are J. P. Wolcott (R., Mich.), R. A. Gamble (R., N. Y.), H. O. Talle (R., Ia.), P. Brown (D., Ga.), and W. Patman (D., Tex.).

• •

New board members for **Air Cargo,** Inc., are Walter Sternberg, vice president-sales for National Airlines, and Emery Johnson, vice president-general manager of ACI.

• •

Delos W. Rentzel is going into oil and trucking, but does not intend to lose touch with aviation. The onetime Undersecretary of Commerce for Transportation, CAB Chairman, and CAA Administrator left W. R. Grace & Co. as of February 1 to take a post as president of Auto Transports Inc. and Texas Auto Transports Inc., with headquarters in Oklahoma City, and to associate himself with the oil firm of Roy G Woods Inc.

• •

Domestic air freight revenues of some $7 million in 1952 and the prospect of a $10 million figure for 1953 have been announced by the Flying Tiger Line. The freight revenues were the largest single source of income for the carrier during last year, a year in which total revenues rose 20% above those of 1951.

Shore duty for Navy's XF2Y-1 Sea Dart, delta wing jet fighter, provides novel view from beneath as it comes up on a ramp. Consolidated Vultee experimental plane is first of its type to use hydro-skis for improved rough water landing and take-off operations.

Trans World Airlines has ordered a number of Curtiss-Wright **Electronic Flight Duplicators,** which will be used for pilot training in New York, Kansas City, Chicago, Detroit, Los Angeles, and San Francisco.

• •

When **Sabena Belgian Airlines** receives its eight DC-6B's it will use them in **tourist services,** including New York-Brussels flights. The 73-seat aircraft will also serve tourist routes in Europe and Africa.

• •

New president of Link Aviation, Inc., is E. Allan Williford, who has been vice president and general manager since February, 1950. Founder and ex-president Edwin A. Link continues as chairman of the board and director of research

• •

Don't try to use taxes that can easily be avoided by those who should theoretically be paying them, the **State of Minnesota** has been advised. A study conducted by the University of Minnesota has pointed out that the scheduled airlines can evade the state's fuel tax by buying their gasoline elsewhere, so Minnesota might as well drop that approach and think about **user charges** for particular facilities and a **gross revenue tax** for general state support.

• •

Ducted fan combination power plants will be the prime source of power for future transport use, according to **C. C. Furnas,** director of the Cornell Aeronautical Laboratory. Such power plants will move transports at speeds around 600 mph for long hauls, 300 mph for shorter runs, Furnas believes; supersonic speeds would not be worth the cost.

• •

Texas is big enough for both Fort Worth and Dallas and their respective airports, the **citizens of Dallas** apparently believe. Undismayed by the forthcoming opening of the Greater Fort Worth International Airport, Dallasites turned out in record numbers to approve a **$12.5 million bond issue** to finance expansion of the city's Love Field and to improve Red Bird Field as an auxiliary.

• •

American Airlines has bought a DC-6 from Philippine Airlines. Conversion to coach configuration is reportedly being done by Lockheed Aircraft Service, although all three parties have kept mum about the deal.

Civil Mobilization Plans Bog Down

Cut in DATA staff hampers work on programs for use of civil transport fleet in emergency.

Airline mobilization planning, intended to furnish industry and government with a blueprint of what the carriers' role will be in case of a war emergency, has bogged down after getting off to a good start last year.

One of the reasons is the reduction from 14 to six of the regular staff of Defense Air Transportation Administration, the agency within the Department of Commerce which handles much of the planning in cooperation with other agencies and with the industry.

Reasons for the reduction, carried out through the office of the outgoing Undersecretary of Commerce for Transportation, have not been made clear. Present hope is that the new administration will make arrangements to step up the planning.

DATA employes now on the job are Tod Hardeen, administrator; David Bluestone, head of the air transport division; Griswold Forbes, legal advisor on loan from the general counsel's office of the Commerce Department, and three girls. The general aviation division, although still in existence, has no director.

DATA handled, in cooperation with the airlines and the Defense Department, formation of the Civil Reserve Air Fleet plan, under which the carriers' four-engine planes will be available under contract to the military in an emergency on 48 hours' notice. However, much work remains to be done on the overall plan, and the question is how DATA can be effective with such a depleted staff.

"The ideal mobilization plan is one in which you're able to use your equipment productively in peacetime and yet have it ready for an emergency," an official who has been close to the situation told AMERICAN AVIATION. "There are few such plans. Probably the outstanding one is CRAF, with the airlines using their planes every day, but making them available to the military if needed.

"Only cost to the government is a few thousand dollars per plane for necessary modifications, and this is a cheap price to pay for a piece of equipment worth over $1,000,000. But there's a lot more that has to be done. It's not a question of building up a big, expensive organization. All you need are a few more qualified people to handle the work. The DATA staff members are doing a good job, but there aren't enough of them."

Among the unfinished business:

• **Plane modifications are not completed.** A standard contract was to be drawn with Air Materiel Command for work on the airlines' fleets. This hasn't been done, and what work is being done is proceeding under letters of intent.

• **No standby contract** has been signed containing price, terms, and conditions under which airlines would operate for the military in an emergency.

• **There's no manpower program** for getting experienced airline personnel into the right emergency jobs. Nothing has been worked out with Selective Service on deferments for essential employes. No fixed policy has been announced on what the military will do about calling airline reservists. For example, one-third of the airline pilots are in the reserve. The carriers have no assurance that they can keep any of them—they're left guessing as to what their pilot situation would be.

• **A final war air service pattern** hasn't been completed by CAB and the airlines, establishing how domestic routes will be operated in wartime, what planes will be transferred between airlines, etc.

• **No plans have been made** to ease the shortage of civil navigators who will be needed in wartime. It was announced last year that the shortage was 1,000 out of 1,400 such navigators needed. It was suggested that airlines might cross-train pilots as navigators, and also locate and arrange for emergency employment of qualified navigators. The government was to take the lead in development of such a program.

CRAF loses much of its effectiveness without a manpower program. The danger is that in the absence of such a program the military might put all necessary personnel into uniform. When CRAF was announced, the Defense Department reserved the right to militarize certain operations, but said this would be done "only in cases of demonstrable necessity." Lack of a plan could well create a "demonstrable necessity."

A better-staffed DATA, it is felt, could aid considerably in pushing along the lagging program and could be more effective in seeing that civil requirements are not overridden by the military.

• • •

Year's Safety Record Set by Carriers

The scheduled airlines of the U.S. this week completed a full year of operations without a fatality, the first time this has happened since 1940. February 11, 1952, when a National Airlines DC-6 crashed at Elizabeth, N. J. and precipitated the closing of Newark Airport, was the last time a scheduled airliner crash resulted in a passenger or crew death or serious injury.

• **During those 12 months,** the scheduled airlines flew a total of 463,466,712 plane-miles, a 576% increase over the 68,610,143 plane-miles flown in 1938.

• **For the year ended February 12,** scheduled lines flew 13,126,883,000 passenger-miles, a 2,241% jump over 1938.

• **Since the last Elizabeth accident,** 24,854,080 passengers were carried by scheduled airlines, a 1,720% hike over the 1,365,706 passengers carried in 1938.

Another demonstration of how scheduled service has grown in the last 15 years is the fact that five carriers individually flew more passengers and passenger-miles within the last 12 months than the entire air transport industry did in 1938. These lines were American, Eastern, Capital, TWA, and United.

During August, September, and October, 1952, passenger-miles flown by the scheduled airlines doubled those flown in 1938. In every month that the new safety mark was being set, scheduled carriers flew more passengers and passenger-miles than during all of 1938.

Last time the airlines had a full year without a mishap was the 12 months ending March 27, 1940. During that period the airlines chalked up 88,108,286 plane-miles and 821,859,148 passenger-miles.

• • •

Bendix, Hazeltine Sign DME Merchandising Pact

Bendix Aviation Corporation and Hazeltine Electronics Corporation have signed a long-range agreement whereby Bendix will merchandise and service Hazeltine DME units for use by commercial operators and private aviation.

Commercial and executive aircraft DME units will weigh about 30 pounds after installation and are expected to sell for between $3,000 and $4,000. A lighter and less expensive model is planned for private aircraft, exclusive of the lightplane class. Final prices and delivery dates have not been set yet.

Planes vs. Tools Battle Looms in Congress

Vance tells economy-minded lawmakers that standby machine tools are more important than planes.

By Robert M. Loebelson

CONGRESS, anxious to balance the budget and cut taxes, is looking around for a way to reduce defense spending, meaning mostly aircraft procurement, without impairing the nation's ability to defend itself.

A small group of men has prepared a blueprint designed to do just that and the group's chairman seems destined to wield considerable influence in the Eisenhower administration. If Congress accepts the thesis, and many economy-minded lawmakers are already looking on the recommendations with favor, it seems inevitable that funds to buy aircraft will be cut sharply.

Aircraft manufacturers have not as yet raised any objections to the proposal, but opposition will probably be forthcoming once the full ramifications of the study become evident.

As a matter of fact, Adm. DeWitt C. Ramsey, president of the Aircraft Industries Association, on at least two occasions has approved the basic thinking behind the recommendations, although each time he qualified his support by stating that necessary corollaries, "even more essential" are adequate research and development and a going rate of aircraft production.

What are these recommendations and who are the men responsible for issuing them?

Chief proponent of the program, which he privately states will enable the U.S. to cut its defense expenditures in half, is Harold S. Vance, president and board chairman of Studebaker Corp. Vance, as chairman of an Office of Defense Mobilization Advisory Committee on Production Equipment, suggested to former Defense Mobilizer Henry H. Fowler that the U.S. embark on a program to create standby plants and machine tools for use *only* in case of full-scale mobilization. That concept apparently has been accepted by President Eisenhower, for he has offered the top ODM post to Vance, who turned it down, for the time being at least.

Vance, who refused the Defense Mobilizer's job because of his connections with Studebaker and past relationship with the new Defense Secretary, Charles E. Wilson, has, however, accepted a post as an ODM consultant.

Other members of the ACPE who helped formulate the recommendations on purchase of special machine tools and construction of standby aircraft and other defense plants, are:

• **Clay P. Bedford,** onetime Defense Production Administration deputy administrator for procurement and production, later Special Assistant for Production to former Defense Secretary Robert A. Lovett, and now president of Chase Aircraft Co. Before entering government service, Bedford was a vice president of Kaiser-Frazer Corp., which owns 49% of Chase.

• **Manly Fleischmann,** Buffalo, N. Y., attorney, and former head of both the National Production Authority and DPA.

• **Lt. Gen. Kenneth B. Wolfe,** USAF (ret.), former USAF Deputy Chief of Staff-Materiel and now president of the Oerlikon Tool and Arms Corp. of America. Wolfe, long a proponent of USAF preparedness, is perhaps best known for his fight for the USAF heavy press program.

• **Vice Adm. W. H. P. Blandy,** USN (ret.), commander of the atomic bomb tests at Bikini in 1946 and now president of the Health Information Foundation.

• **Lt. Gen. LeRoy Lutes,** USA (ret.), commanding general of the Army Service Forces in 1946 and now president of the Pacific Tire and Rubber Co.

• **Rear Adm. Lewis L. Strauss,** USNR, banker, member of the Atomic Energy Commission from 1946 to 1950 and financial advisor to the Rockefellers since then.

This group of men, described by AIA president Ramsey as "a distinguished advisory committee," has already met with partial success. Their recommendations for a long-range purchase program of machine tools have been included in the fiscal 1954 budget, where a down payment of $500 million for this purpose has been requested.

In the report to the Defense Mobilizer, the Vance committee recognized that it would not be possible to make total substitution of production capacity for finished weapons. But the seven men proposed that U.S. policy in preparing for a mobilization period should be "to substitute, to the greatest extent practicable, production capacity for the stockpiling of military end items." To implement that policy, the ACPE suggested that:

• **The Defense Department** immediately complete a statement of phased mobilization end-item requirements within the range of the country's known resources, and that the requirements be continually reviewed and revised.

• **Additional production facilities** required to carry out the policy be created without delay.

• **Production facilities** for mobilization be maintained in an up-to-date condition, ready for rapid activation in case of emergency.

• **Where there is not** enough capacity to produce machine tools, the U.S. should make every possible attempt to stimulate creation of the needed capacity by private industry. If these efforts fail because the required capacity turns out to be unprofitable, the Government should create and maintain this capacity on its own.

• **The Defense Department** and Congress take whatever action is necessary to confirm and support this policy.

Vance and his colleagues pointed out that while such a policy provides "a tremendous opportunity for economy which should be exploited in our mobilization effort" and "represents a greater contribution to national security in a long-term program of preparedness," it will also serve a second purpose: maintenance of the machine tool industry.

While no exact figure can be given on the value of the additional production equipment needed, the ACPE estimates the cost of these tools at between $1 and $2 billion. In addition, the estimated $6 billion in present Government-owned machine tools must be maintained and replaced, at an annual charge of about 5%. This means that about $300 million worth of machine tool business should originate from the Government to maintain and keep present tools modernized.

Such a program to keep machine tool producers turning out equipment at a reasonably high level (current production is at a rate of $1.2 billion a year) would help make certain that past tool shortages will not recur when the U.S. wants a fast buildup.

Thus the producers of aircraft face a challenge which may result in reduced military appropriations to buy the fighters, bombers, transports, and trainers they build. If military leaders, especially in the Air Force, can convince Congress that the U.S. needs both aircraft and the facilities to produce them, the aircraft industry will not suffer. If, however, Congress decides that plants are an adequate substitute for planes in being, plane builders face another contraction.

• • •

Interview

with

W. A. Patterson

President

United Air Lines

Patterson Speaks His Mind

William Allan ("Pat") Patterson, president of United Air Lines, is currently engaged in a controversy with the CAB and the CAA over how many passengers should be carried aboard UAL's transcontinental DC-4 coach flights (see page 21). In the following interview he gives his views on some of the economic problems which face the air transport industry today.

Patterson has been dealing with such problems for the past 23 years, all of which have been spent with UAL and its predecessors. For 19 of these years he has been UAL's president.

Born in Honolulu on October 1, 1899, the son of an overseer for a Hawaiian sugar company, Patterson obtained his elementary education in San Francisco and later attended Honolulu Military Academy. At the age of 15 he became an office boy for Wells Fargo Bank, San Francisco, and attended night school for the next 13 years. He remained with the bank for 15 years, becoming assistant to one of the vice presidents.

His interest in air transportation dates from the time the bank placed him in charge of the account of Pacific Air Transport, a predecessor division of UAL. On April 1, 1929, he resigned from the bank to become assistant to the president of Boeing Airplane Company, which was then engaged in air transportation as well as aircraft manufacturing. In 1933, he was named vice president of United Air Lines at the time when Boeing Air Transport, Varney Air Lines, Pacific Air Transport, and National Air Transport were put together into what is now the UAL system.

In 1934, he became UAL's president, and today heads a system which covers 13,250 route miles in the U.S. and to Hawaii, and which has more than 13,500 employes.

Q. Recently you were quoted as requesting a study of Government policy pertaining to the regulation of all forms of transportation. Can you elaborate on your views in this regard?

A. Air transportation has grown to a point where it should now be considered a part of the overall transportation system of the country. Government's responsibility is for all transportation to be sound. We have reached a point where there should be a reexamination of all laws having to do with transportation regulation. Modifications should be made to bring those laws up to date. Anyone making such a study would come to the conclusion that there should be some coordination between the different forms of transportation and the overall philosophy and policy of the Government.

That does not mean that we would necessarily go under the Interstate Commerce Commission. The only comprehensive study I have seen was the old Eastman Program, "Federal Coordination and Regulation of Transportation." As I recall, there was an overall ICC setup. That might be a court of appeals, so to speak. Under that might be the regulatory bodies for air, rail, bus, and what not. They would make decisions but appeals could be taken to the overall agency. Without question there would be some changes today but the Eastman Report would be an excellent starting place.

Q. Is the present capital structure of the air transportation industry sound?

A. Yes, I think in most cases the capital structure of the airlines is sound. I have some concern as to the ability of that structure to take on the next step in our progress, which is the jet. The tremendous equipment expansion ahead presents a rather complicated problem in financing. Today the price of the jet is in the conversational stage, but even that conversation is staggering. When you talk about airplanes costing $3½ to $4 million, you wonder how you are going to handle the program. The value of United Air Lines' fleet of 61 Boeing 247 airplanes in 1934 was $3,400,000. Now we are talking about one unit that might cost more than that entire fleet.

Q. Have you compared the earning power, the revenue-producing capacity of the two units?

A. The earning capacity of faster planes already has been demonstrated by the DC-6 without going into jet. The fact that in an economy of rising price and wage levels, we have been able to absorb all the added costs that every other business has been exposed to and still maintain existing tariffs, is evidence of the effects of greater carrying capacity and speed. The more efficient airplane has absorbed the higher costs.

We have two problems: We must provide technical progress, but in doing so we must be sure that each airplane we buy will do the job cheaper than the one we are about to eliminate. We haven't been able to satisfy ourselves that we can get a jet whose ton-mile cost of operation will not be higher than that of our present airplanes. It might run as high as 25 percent more.

Q. Are rapid tax write-offs having any appreciable effect on the airline economic picture?

A. We are not using any unusual tax write-offs for tax purposes. For instance, we have not used accelerated write-offs as some airlines have of new equipment they have bought.

"The jet is going to breathe on the neck of the DC-7"

Q. Why haven't you?

A. We did not buy airplanes for the specific purpose of meeting a national defense requirement; we never were asked to buy them for a national defense reserve, although our expanded fleet is available to help meet a national emergency and our added lift has greatly assisted in moving personnel and cargo as a result of the defense program and Korean action. On the other hand, it would be proper to use an accelerated write-off on the DC-7 because we think the jet is going to breathe on the neck of the DC-7 very fast.

Q. Do you foresee any change in financing methods?

A. Despite the essential growth characteristic of our industry, there has been little recent opportunity for sale of common stock in a volume sufficient to fill a substantial part of capital needs. United has been able to obtain equity capital through sale of convertible preferred stock, where the conversion privilege and the preferential dividend have combined to attract buyers seeking both income and a chance for capital appreciation. The outlook for equity financing in the volume required for expected expansion depends on continued progress toward earnings stability and the payment of more adequate dividends on a regular basis.

As I have said before, CAB policy will have an important bearing, particularly on the ability of the airlines to compete for the investor's equity dollar. Certainly it is desirable for the airline industry to broaden its capital base through common stock financing. At the same time, the relatively short term bank loan as a part of a financial program will continue to be important, particularly in view of the large depreciation run-off in the industry. A term loan which provides for repayment over a four or five year period fits well with present depreciation policy in the industry. I do not believe the pattern of financing in the industry will undergo any material change in the near future.

Q. How does the airline financial picture look now?

A. Speaking for United, considerable progress was made in 1952 which, barring the unexpected, should continue in 1953. For the industry, much depends on the ability of the carriers to produce added volume and introduce further efficiencies as offsets to continued cost increases. One important factor will be the attitude of the CAB in the forthcoming General Fare Investigation. A decision to increase fares by the Board in that case would go far to increase stability, further improve profit margins and provide healthy earnings so essential to continued growth and development of the industry. A decision to lower airline rates and cut profit margins could have a highly adverse effect on the ability to attract capital. We no longer can rely on "romance" to sell airline stocks. The CAB must recognize the rapid turnover in capital in this industry and the need for a lower operating ratio.

Q. You don't see a need for a higher ratio of debt finance?

A. No. In our company, we are working on a theory of not exceeding 40 percent debt. You can talk to different people and get different theories. Some people feel 50-50 isn't bad. But we take the position of 60-40. While we are not wedded to it, we feel it is a conservative basis.

Q. What break-down load factors does UAL experience?

A. Our break-even passenger load factor is 58.7 percent. That's been coming down constantly.

Q. In 1952, the domestic airlines reached a new high in traffic but their net operating income dropped. What was the reason for that?

A. Increased operating expense.

Q. Then in 1953 and the future are you going to be able to make sufficient profits to become an attractive investment to the public? Will it be necessary to raise fares?

A. For the industry to make the same amount of money this year as last, it will have to take in 15 percent more in revenues. Thus while the present level of air passenger fares may be satisfactory, there is a question mark as to next year. How much longer can we absorb rising costs through increased volume? It is not beyond the realms of probability that business could fall off 15 percent. We feel that the Korean war and everything it generates in our national defense is responsible for as much as 20 percent of our volume. I don't know an airline in the United States today that could suffer a 15 percent decrease in volume and not come very close to going into the red or be in the red. It isn't unusual to expect in normal times that the volume of any business might fluctuate 15 percent, but this business could not take it. You would have to increase revenue by raising fares, for example.

Q. Would it be logical to plan on increasing fares when you introduce jet transports?

A. On the face of it, the public should get cheaper air transportation with jet speed. That is why we are interested, not so much in the technical design of the jet—our people are pretty well satisfied on everything except for decompression situations. They now are taking the technical information and working to produce an economic result.

Q. There has been some comment that the upward trend in operating costs has leveled off.

A. Well, let's take operating cost per revenue ton-mile for the industry. It is .496c for the industry and .424c for United as against our 1951 figure of .423c. This table shows the trend:

Year	Industry	United
1948	.600c	.548c
1949	.561c	.504c
1950	.504c	.437c
1951	.474c	.423c
1952 (year ending 9/30/52)	.496c	.424c

You can see United Air Lines' experience—that since 1949, our operating expense declined from 50¢ to 42¢. Only this year we showed a slightly upward trend. My own opinion is that our trend will continue to be slightly upward.

Q. Do you feel the industry trend will follow it?

A. I wouldn't be able to judge. In 1951 the industry was at .474¢ and went to .496¢. In other words, the industry rise was over 2¢ whereas United Air Lines went up only a mill. One reason for this is that we play the equipment picture pretty close to our belts. When you do that and you get a war, you don't look so good; if you get a depression you look wonderful. Well, we are not looking for a depression—we try to play it half way.

"United . . . is definitely in the coach business"

Q. What is the outlook for increased passenger traffic in 1953?

A. Everybody is figuring around a 10 to 15 percent increase this coming year. Last year the industry increase was about 17 percent and United's, 29. That's mainly because we received delivery on new aircraft during the year.

Q. What percent of airline revenues came from passenger traffic?

A. In 1940 the ratio of industry passenger revenue to all revenues was 69 percent; it now is 85 percent.

Q. What effect will increased wages have on UAL's 1953 costs?

A. When we finish negotiating our contracts, raising salaries and adding new people to help handle the increased volume of flying, our payroll is going up several million dollars.

Q. How much of that is by new people and how much by wage increase?

A. I would say roughly about 60 percent pay to those now on our payroll and 40 percent to new people. Then there are the heavier depreciation costs with new equipment. In 1954 some of our DC-6's go off our books, but we are bringing in DC-7's so there is no chance that depreciation rates will level off to any degree in the next three years.

Q. How important is the coach business to the airlines?

A. Coach business now equals about 18 percent of the overall volume of the scheduled airlines. However, the gain in first-class travel has been higher than that in coach. You can figure close to a 35 percent diversion of first-class travel to coach. There is a detrimental practice developing—business organizations, particularly in the mercantile field, will say to their buyers, "You go coach and we will split the savings with you; you can have $25 personally and we will take the other $25." There is some of that thing going on.

United Air Lines is definitely in the coach business. Actually, coach business has never had a real test, because we are in a sellers' market. We think a future pattern for our whole industry is difficult to forecast now because of that type of market. Theoretically the coach business should suffer a greater seasonal fluctuation than the first-class market. But there has been no way of testing that because in a sellers' market the demand is so great throughout the year. Among other things, it is greatly influenced by returning veterans who jam coach planes when the boats come in. If they weren't there, we don't know who would be.

Q. Can United make money with a 58 passenger DC-4 coach?

A. Yes, our figures prove it conclusively.

Q. How many of these people, above 54 in 66 seat DC-4's, have been automatically taken care of by your present operating load factors? In other words, aren't you actually operating down in that order even with the theoretical 54?

A. We are operating with a load factor of about 76 percent on the 54-passenger planes. We have tried to point out to the CAB that we are after a wide aisle with proper exits. We are going to continue to work on the evacuation problem.

Q. You are starting DC-6 coach service?

A. Yes, we have extensive plans for DC-6 coach service as Ray Ireland, our vice president of traffic, first disclosed to the CAB last October 17.

First, we will begin coach service four times weekly from Los Angeles and San Francisco to Honolulu on March 22. Then, on or before April 26, we will open two daily round trip coach flights between San Francisco, Chicago and New York. One of these will stop at Oakland. These schedules will be in addition to our standard fare service on both routes, and also to DC-4 air coach flights serving certain intermediate cities from coast to coast and along the Pacific Coast.

Still further expansion of coach service is planned to such cities as Detroit, Cleveland, Boston and Washington, as well as transcontinental eastbound trips out of Los Angeles which now receive air coach service to San Francisco and the Pacific Northwest.

The seating arrangement of our DC-6 coaches will be in line with our safety standards. There will be two abreast seating and accommodations for 72 passengers. Seat spacing will be 35 inches, as compared with the 33-38 inch range on DC-4 coaches.

Q. There is a lot of contention as to whether or not the scheduled airlines are making proper inroads into the air cargo field. Is this primarily an equipment problem?

A. We could and will do better. As we get our DC-7's, you will see a substantial expansion of our cargo service. I don't think it is a question of a suitable airplane; I don't know what is a suitable airplane. I think it is a case of learning how to handle air cargo on the ground a lot more effectively so as to reduce handling costs. If you have watched the handling of cargo you know that every piece is involved in a triple play. One of our immediate projects must be the improvement of ground facilities to keep pace with progress in the air. Thus far, we have spent the majority of our time and effort in the scientific and technical development of the airplane.

The possibilities for improvement on the ground are enormous. For every gate position that an airline has at a large terminal, there is $70,000 invested in individual step-ladders, automobiles, air conditioners and whatnot. We're going to have to mechanize our facilities so that an airplane can be moved into a dock and baggage, mail and cargo can be moved directly into the terminal without a lot of handling on the ramp. By such methods, we not only will improve service to our customers but we will be able to save substantial sums of money.

I think an example of progress which can be made in this direction is given in the operation of our San Francisco maintenance base. We built it at a cost of $7,700,000—a plant which some people in financial circles referred to during the first six months of its operation as "United Air Lines' folly". Actually, that "folly" has reduced our man-hours on overhaul of engines, aircraft and instruments by 22½ percent. We will pay for the base in six years, which I don't think is a bad investment.

Q. There have been several estimates of air cargo for the year 1960. Lockheed and Douglas have both estimated over a billion ton-miles per year; CAA estimates 700,000 ton-miles. Does that look realistic to you? The manufacturers assumed that the cost per ton-mile will be down to about 12 cents and CAA assumed that it will be not much different than at present, approximately 20 cents.

A. I would say that anything within that area might

people with get-up-and-go

like the Convair's get-up-and-go!

PEOPLE ON THE GO — for business or fun — like to fly the Convair. They call it the plane with built-in *get-up-and-go!* Even the folks who wave good-bye thrill at the Convair's nimble takeoff! Convair's hand-baggage racks and self-contained stairway speed departure and arrival time as much as 30 minutes. Ask your favorite airline or travel agent to make *your* next flight a Convair . . . the world's most popular passenger plane.

As a transport-trainer for the U. S. Air Force, the Convair is setting new records for versatility and performance . . . another evidence of Convair's ENGINEERING TO THE Nth POWER

CONVAIR

SAN DIEGO AND POMONA, CALIFORNIA
FORT WORTH AND DAINGERFIELD, TEXAS

MORE AIRLINES HAVE CHOSEN THE CONVAIR THAN ANY OTHER MODERN PASSENGER PLANE:

Now Flying
Aero O/Y (Finland)
Aerolineas Argentinas
American
Braniff
Canadian Pacific
Chicago & Southern
Continental
Delta
Ethiopian
Garuda Indonesian
Hawaiian
K.L.M. Royal Dutch
Northeast
Orient
Pan American
Sabena-Belgian
Swissair (Switzerland)
Trans-Australia
United
Western

Soon to Fly
Aeronaves de Mexico
AVENSA (Venezuela)
C.M.A. (Mexico)
Cruzeiro do Sul (Brazil)
J.A.T. (Yugoslavia)
National
Philippine
Pioneer

"Under no circumstances could we . . . purchase . . . the Comet"

be realistic. I would say that the CAA estimate is closer. The manufacturer is a great one to tell you what you are going to perform a ton-mile for. He doesn't sit there when those unions come around and ask for a 25 cent an hour raise and realize what it means per ton-mile. If he can tell me what our wage rates are going to be in 1960, he is better off than I.

Q. Do you want to comment on the non-scheduled airline situation?

A. The scheduled airlines have a certain philosophy of doing business. We have certain standards, most of them learned the hard way from experience. We learned that certain things we do which are very expensive nevertheless are the things to do. We learned certain checks and balances as a result of some incident or accident. The non-sked has another philosophy. Under the good old American system, whoever is right is going to survive.

Q. Do you see any potential use of a foreign built jet by a domestic airline?

A. It is a great inducement when you are told that you can buy a Comet for $1½ million and when our domestic manufacturers are talking about $3½ million. But I am wondering whether such a move would be potentially practical. I can visualize United announcing that it was going to buy airplanes from Great Britain. There would be two reactions in Washington. The State Department, the ECA and others in that category would think "Isn't that a wonderful thing. Now we are beginning to get some trade from Europe." On the other hand, Mr. Douglas would send his man to Washington, Mr. Boeing his, and Mr. Lockheed his, and they would say "Here is a business which was built up through subsidy. It was designed for the purpose of advancing American aviation. Now they are taking all this development and going to Europe to buy."

Let me say here that I think the British have made a real contribution to the development of commercial jet transport planes, but the situation in this country has been somewhat different. We have a private enterprise system and a responsibility to our stockholders. When we buy an airplane, we must satisfy ourselves that, along with technological progress and advancement, the end economic result will be better than with equipment presently in use or that the cost per ton-mile will be lower. Under no economic circumstances could we justify purchase of the British Comet.

Q. What do you see as the best answer to the jet transport coming up economically? Does Douglas, for instance, approach it?

A. Yes, Douglas approaches it in trying to build in an economic result and I think Lockheed does too. There are, of course, many problems. Let me give you one example: to get full advantage of the particular airplane we are thinking about, we should fly a minimum of 1500 miles without stopping. Only 13½ percent of our passengers now fly over 1500 miles. For that particular segment of the traveling public, there is the question of how many airplanes we would need. Theoretically, we would need one for every two DC-6's we now have. This would permit one or two round trips a day from San Francisco to Chicago.

Then we come to this problem: the passenger going from Chicago to San Francisco in a jet is going to get there before the fellow traveling from Chicago to Denver. You would have an inbalance there and people would demand the same relative speed.

Q. Would you actually consider an airplane that wouldn't operate under a 1500 mile stage length?

A. No, we wouldn't. Theoretically a DC-6 never should stop under 600 miles. It does. But you can't water your overall operation with too much local service with a long haul airplane. There must be a sensible ratio.

Airlines are working together on the jet problem and it is a very constructive joint move. We're thinking about a plane that will travel 530 to 550 miles an hour, that will climb 1000 feet a minute and will cruise at 40,000 feet. Our conclusions at the moment indicate that such an airplane would be efficient and a money-maker provided it could fly at least 1500 miles without a stop. However, we know that we probably are going to have to provide some jet service on segments under 1500 miles and, if our theoretical airplane won't work economically under that distance, we will have to take a new engineering approach.

Q. How many jets do you feel that United would have use for initially?

A. We have arrived at a minimum number of 10 if we were making a decision today, but we don't want to make a decision today because it would not be a good one. We think that, if everything worked well mechanically, 10 airplanes would take care of our transcontinental traffic.

Q. Do you see the time coming when the domestic airline's long-haul market is going to become saturated?

A. No, I think a new airplane which would fly coast to coast in 4½ hours should generate a lot of new long-haul business. This is why we can't use our present 13½ percent proportion of passengers flying 1500 miles or more, as an ironclad figure.

Q. Then what does that do to future equipment plans?

A. We either have to find a jet or a turboprop. The turboprop should not be ruled out of the picture. For domestic operations, it shows greater potentiality for the airline than the pure jet because it can be used for more intermediate business.

Q. Is anyone showing you any turboprop proposal that shows any promise?

A. Yes, they are very promising but you must face the fact that you are dealing with a paper engine.

Q. Summing up everything, what do you think of the overall airline situation today?

A. Certainly we have reason to be proud of our advances over the past quarter century and we can look to even greater progress immediately ahead. Sometimes I think we in the industry get so involved in our day-to-day problems that we are inclined to overlook the major accomplishments we have made.

I don't have to recite figures on that progress to you gentlemen. I merely can point to the great advancements in safety, speed, comfort, operating efficiency and self-sufficiency of scheduled air transportation. With these advances, we have been able to give the passenger and shipper a better buy for his money, year after year, and we have been accorded an increasing public acceptance which has reflected an appreciation of this fact. One of the most notable features of our progress recently has been the airline safety record. We know that, like other forms of transportation, we probably never will operate in perfect safety—but we have come a long way in our objective of becoming the safest means of transportation. When we can make that claim, on the basis of a long-term safety record, we really will have arrived.

UAL-CAB Seating Fight Heads for Court

The United Air Lines-CAB DC-4 coach fight was headed for a showdown last week with both parties ready to turn to the civil courts to enforce their individual arguments.

United remained steadfast in its stand limiting DC-4 coaches to 54 seats in the interest of its safety arguments. CAB was equally firm in its position that United was violating the Act by not observing economic standards set by the Board for coach services.

Board Suspends Tariff

Setting the stage for a last-ditch court battle were two actions of the CAB. In one, the Board suspended a United tariff which, on February 12, would have established the 54-seat limitation at prevailing coach fares. Suspension is for 90 days and public hearings will be held. In the other action CAB refused to reconsider a January 6 order in which it found United to be violating the Act by continuation of its seating practice.

CAB indicated the entire fare structure of the industry might be upset if it permitted United's proposed tariff to become effective. The Board said it could not conclude "on the basis of the matters submitted to it at this time that the application of air coach fares to the reduced seating capacity would be fair and reasonable within the meaning of the Act."

CAB claims it has no safety argument with United. It contends that if United feels Board minimums for DC-4 coaches are unsafe, it has the alternative of discontinuing the service. But, it says, if United wants to continue the 54-seat practice, it cannot do so at present coach fares.

This did not sway United from its position. Responding, the carrier issued this statement: "W. A. Patterson, president of United, said that the company's attorneys will study the Civil Aeronautics Board order but they do not interpret it as requiring immediate suspension of its DC-4 coach service. In the light of that interpretation, and until further clarification, United is continuing its present coach services."

Board Allows 'Cushion'

This in turn caused CAB to refer again to its enforcement powers and informally, the Board was granting the line a "two or three-day cushion" at press-time, before starting an enforcement action.

United, meanwhile, had its lawyers studying the possibility of securing a court order to set aside the CAB ruling against United's tariff which was to become effective February 12. If successful, this would mean United would have an effective tariff beginning with February 12 and would no longer be in violation.

CAB had some court designs of its own. If United disregarded the planned enforcement action, CAB was studying the possibility of going to court to enjoin the carrier from continuing its "violations."

• • •

New Bonanza, the model D35, is being delivered to 22 states and to Switzerland at $18,990 each (fly-away factory). Firm orders total 85. New features include improved cabin ventilation, low noise level, a useful load increased by 22 pounds; new gross weight of 2,725 pounds. Company officials state that the D35 exemplifies Beech Aircraft's interest in the market for airplanes "owned by American businesses" which, it estimates, now includes some 10,000 planes.

L. R. "Mike" Hackney, executive vice president of the newly reactivated Air Freight Association, renamed Transport Air Group, is establishing headquarters in Washington, where he will represent the interests of California Eastern Airways, Flying Tiger Line, Inc., Overseas National Airways, Seaboard & Western Airlines, Inc., Slick Airways, Inc., and Transocean Air Lines.

NEWS BRIEFS

BOAC Stratocruisers went back in service, after a **grounding order** had followed several cases of engine trouble. Source of the trouble proved to be "unsatisfactory lubrication of the engine bearings due to excessive dilution of the lubricant with gasoline and air."

• •

Eight **Curtiss C-46's** have been returned to the USAF by **Pan American** after several years of service, on lease, for all-cargo flights in the carrier's Latin American division. Douglas DC-4's will replace them.

• •

A landing accident followed by fire destroyed a **C-69 Constellation** which Intercontinental Airways, Burbank, Calif., had just finished rebuilding. Transition flights were in progress, and apparently the landing gear hadn't been lowered for the landing. Eight aboard escaped without injury.

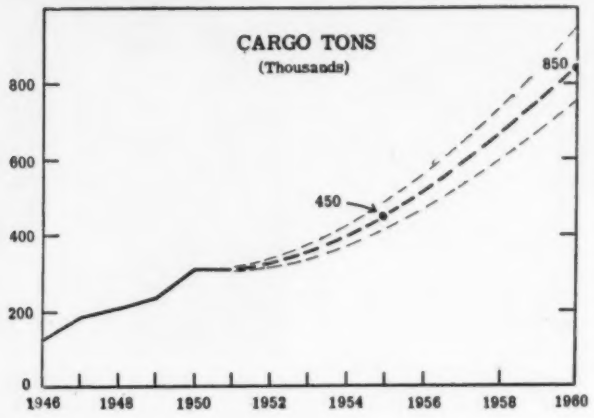
• •

Private aircraft of up to 3,500 pounds in Britain may now use **certificates of airworthiness** for three years instead of one. Extension is based on new maintenance schedule prepared by Royal Aero Club and Air Registration Board.

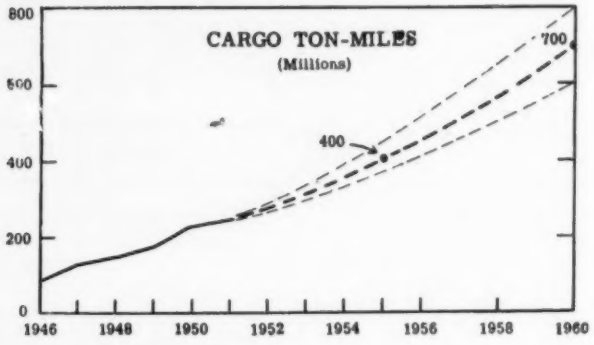
• •

The last of Eastern Air Lines' DC-3's were turned out to pasture on January 31, when three of them flew their last routes before being replaced by Martin 4-0-4's. One went to the Smithsonian, the others to local service and nonscheduled carriers.

Freight's Future: More Tons...



...Carried More Miles



...By More Planes

Computation of 1960 Cargo Ton-Mile Capacity

Aircraft type (1)	Number of planes (2)	Average payload tons per aircraft [1] (3)	Average daily hours airborne utilization [2] (4)	Airborne speed [3] (5)	Daily ton-mile capacity (2)x(3) x(4)x(5) (6)	Annual ton-mile capacity (000) (6)x366 (7)
DOMESTIC—PASSENGER-CARGO FLEET						
DC-3 or equiv. ..	350	.4	7.00	150	147,000	53,802
CV-240, CV-340, M-202, M-404 or equiv.	325	1.3	5.41	200	457,145	167,315
DC-4 or equiv. ..	100	1.4	8.10	191	216,594	79,274
DC-6, L-049, L-749 or equiv. ..	185	1.9	8.22	243	702,107	256,971
DC-6B, DC-7, L-1049, L-1049C or equiv.	190	3.2	8.89	275	1,486,408	544,025
TOTALS	1,150	.....	.....	.....	3,009,254	1,101,387
ALL-CARGO FLEET			(See note 2)	(See note 2)		
C-46/DC-3 equiv.	75	5.5	6.7	175	483,665	177,422
DC-4 or equiv. ..	45	8.0	5.6	188	378,990	138,710
DC-6A, L-1049B or equiv.[3]	40	14.0	8.5	272	1,294,720	473,868
TOTALS	160	.....	.....	.....	2,157,375	790,000

[1] Cargo capacities of passenger-cargo combination aircraft are based on an average density of 9.6 pounds per cubic foot of cargo compartment space.
[2] Based on 1951 experience for total time wheels up until wheels down.
[3] Estimates based on manufacturer's specifications and characteristics of similar aircraft.
Source: Columns 3, 4 and 5 obtained from CAB Docket No. 5132, Exhibit No. BAO-6. Column 2 estimated by CAA.

DOMESTIC air cargo will play an increasingly important role in the U.S. economy and by 1960 the airlines and the certificated freight carriers should reach a volume of 850,000 tons and 700 million ton-miles annually, or 2.8 times more than 1951, according to a CAA staff study.

CAA's forecast is conservative compared with other studies which have predicted over one billion ton-miles by 1960. The conservatism results from CAA's belief that the present rate level of about 20c a ton-mile will prevail, while other studies have been based on rates as low as 12c.

Here are CAA's principal findings:

• **From 246 million ton-miles** in 1951, business will grow to 400 million by 1955.

• **By 1960,** a minimum of 700,000 tons and 600 million ton-miles will be reached. If an efficient cargo plane were to become available, and business were aggressively promoted, traffic could reach 950,000 tons and 800 million ton-miles. The "intermediate" forecast is 850,000 and 700 million.

• **About 160 all-cargo planes** will be needed, or 50 more than are in use today. The C-46 and DC-4 will remain the backbone of the fleet and will gradually be replaced by the DC-6A and possibly the Lockheed L-1049B.

• **The 160 cargo planes** will include 75 in the C-46 class, 45 in the DC-4 class, and 40 DC-6A/Constellation types.

• **Two-thirds of the 1960 ton-miles** will be carried on all-cargo flights, including all the traffic of the freight lines and half of the passenger lines' business. In 1951, 57% went on cargo planes, 43% on combination aircraft.

Important in CAA's reasoning is the new equipment problem. Any big reduction in cargo rates must await development of an efficient low-cost plane specifically designed for cargo, it said. Operating cost of the DC-6A is not appreciably under the C-46 and DC-4 because the latter types are almost fully depreciated.

The increase anticipated in air cargo traffic appears virtually to preclude commercial development of a cargo design between now and 1960, CAA said, adding that "if the air freight industry is to get the type of aircraft it needs during this period, it is more likely to be the outgrowth of future military design or possibly of Federal financing of prototype development."

It appears that the only important new civil cargo plane which may be available five years hence is a turboprop Constellation L-1149D, for which operating costs are calculated at 4.2c per ton-mile under the ATA formula with a 38,800-pound payload, the study said. There's no aircraft in sight that will

neet the Prototype Aircraft Advisory Committee's specifications for a 50,000-pound payload, it added.

In making its traffic predictions, CAA said that U.S. total production (gross national product), which was $329 billion in 1951, is expected to top $400 billion by 1960, and that a close correlation exists between expenditures for transportation and general business activity.

Other favorable factors: as traffic volume expands, more routes and all-cargo flights will be scheduled, adding to the carriers' ability to provide regular, dependable service. Ground handling techniques (slowness of which has detracted from speed of service) are being improved, and greater interest is being shown in development of terminal and warehousing facilities specially adapted to air freight. Although their rates won't go down, carriers may improve their competitive position if surface lines continue to raise their tariffs.

Another bright spot in the picture has been the success of directional commodity rates, which have done much to bring west-east and south-north volume closer to east-west and north-south, the study said. About 60% of volume travels under specific commodity rates and 13% under directional rates.

Although airlines have devoted considerable attention to cargo, they have not "sold" it to the extent that the cargo carriers have, CAA stated. Scheduled lines' planes were taken for the Korean lift, and they were pressed to handle passenger demand. In addition, passengers return them 45c to 60c a ton-mile, against 20c for cargo.

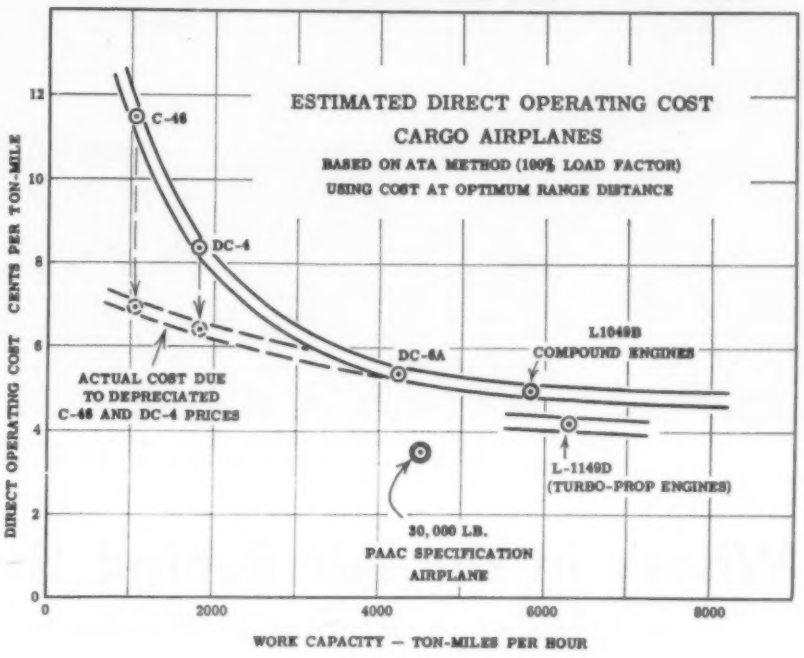
Passenger lines' future interest in cargo will probably be affected by the speed with which air coach business is developed, the study said, adding that if this market becomes saturated more rapidly than anticipated and equipment capacity shows signs of outrunning available traffic, greater stress will be laid on cargo.

There won't be much change in the character of freight traffic, except for a possible increase in the proportion of perishables brought about by directional rates, it stated. Air freight commodities are largely those with a relatively high value per pound, a fairly low density per cubic foot, or a particular need for speed. They fall primarily in the general category of manufactured goods. The bulk of volume appears to have been diverted from railway express.

Although a small number of industries still contribute the bulk of freight shipments, there has been an encouraging increase in diversification of traffic, CAA found. Whereas wearing apparel, textiles, and flowers made up 44.1% of volume in 1947, these commodities represented only 23.6% in 1951.

• • •

Cost Goes Down as Capacity Goes Up



What Some Others Say

Forecasts of Domestic Air Cargo Ton-Miles

Source number	Source	Rate assumed (cents)	Year made	Forecast, ton-miles (add 000)
	Forecast Year 1960			
1	Douglas Aircraft Co.	12	1952	1,350,000
2	Lockheed Aircraft Corp.	N.S.	1952	1,199,000
3	Port of N. Y. Authority	14-16	1950	555,900
4	Air Transport Association	current	1952	370,585
	Forecast Year 1955			
5	General Electric Co.	10	1943	1,600,000
6	Civil Aeronautics Adm'n	18	1948	1,150,000
7	National Resources Plan. Bd.	18	1942	550,000
2	Lockheed Aircraft Corp.	N.S.	1952	418,000-503,000
3	Port of N. Y. Authority	14-16	1950	370,600
8	Civil Aeronautics Adm'n	20	1945	120,000
	Forecast Year 1950			
9	California Eastern Airways	12	1946	5,633,000
9	Slick Airways	9	1946	5,000,000
10	Douglas Aircraft Co.	15	1945	3,900,000
11	Edward P. Warner	6	1945	2,000,000
12	Air Cargo, Inc.	18	1945	331,500
10	Douglas Aircraft Co.	N.S.	1945	327,000
13	Curtiss-Wright Corp.	20	1944	253,600

1. Douglas Aircraft Co., *Douglas DC-6A Airfreight Study, 1952.*
2. Lockheed Aircraft Corp., *Air Cargo Trends,* 1952.
3. Port of N. Y. Authority, 1950, *Air Traffic Forecast, 1950-1980.*
4. Air Transport Assn., *Planes,* Vol. 8, No. 9, October 1952.
5. General Electric Co., *Study of Postwar Air Transport, 1943.*
6. CAA, *Domestic Air Cargo,* December 1948.
7. Nat'l Resources Planning Board, *Transportation & National Policy, 1942.*
8. CAA, *Civil Aviation and the Nat'l Economy, 1945,* certificated airlines only.
9. Exhibits in CAB Docket 810 et al, 1946.
10. Forecast made in 1945 reported in CAA, *Civil Aviation and the National Economy.* Forecast made in 1947 as reported in *Air Transportation,* Nov. 10, 1947.
11. As reported in CAA, *Civil Aviation and the National Economy,* 1945, estimate for air express only.
12. Air Cargo, Inc. Studies of Air Cargo Potential in 33 manufacturing industries only, 1945.
13. Curtiss-Wright Corp. *Air Transportation in the Immediate Post-War Period, 1944.*

THE MIG-17, a high-performance twin-jet fighter suitable for all-weather or day interception duties, exemplifies the modern planes with which the Red Air Force is being re-equipped.

What's in the Air Behind the Iron Curtain?

Intelligence reports reveal new models coming into production, plants and bases fast being expanded.

By ANTHONY VANDYK

INDICATION that Russia military aeronautical development and production may be outstripping our own has come from AMERICAN AVIATION's intelligence sources. In every category of combat aircraft Soviet Russia has models coming into production—some are already rolling off the lines—comparable or superior to American and British types.

On the eastern and western perimeters of the Communist bloc, bases and production centers are being built up. No longer are aircraft plants and major air bases confined to western and central Russia—today the trend is toward the development of Russia's Far East and its satellite Eastern Germany as air arsenals and springboards for Soviet offensive and defensive air power.

In presenting this report on latest developments in Soviet military aviation, deliberate emphasis is placed on the accompanying illustrations and no attempt is made to give more than a general account of a plane's characteristics and performance. Why? Because many people in the Communist bloc see Russian aircraft on the production line, outside plants, at air bases, and in the air—but very few have access to blueprints and specifications.

For a few years after the war German aeronautical engineers who returned from the Soviet Union were a fruitful source of such detailed information; today however, there are no foreigners in key positions in the Russian aircraft industry. Trustworthy information is consequently far more readily obtainable on the external appearance of a plane and where it is produced and based than on its characteristics and performance, its engines, and its radar equipment.

Moreover, the observer who can describe an aircraft's external appearance and perhaps give an approximate account of its take-off and landing behavior is unlikely to be able to identify the model's designation or be aware of the name of its designers, let alone know its altitude performance and range.

Changes Since MiG-15

Bearing this essential background in mind, the Soviet aircraft picture can be brought into perspective. It is a fascinating picture and one that has undergone many changes since the West first learned of the MiG-15, the fighter which made the world realize that the Russian aircraft industry is capable of initiating as well as copying good designs.

• **MiG-17:** Certain of the features of the MiG-15 are apparent in the latest Soviet production jet fighter—the MiG-17, a twin-engine (axial-flow) single-seater model with a liberal radar installation. Although primarily intended for day interception it can be used for all-weather duties.

Top speed is probably about 635 mph at sea level and 650 mph at 10,000 feet. Rate of climb is 6,000 feet a minute, and service ceiling is in the neighborhood of 50,000 feet. Other specs for the MiG-17 are: fuel capacity, 4,000 gallons; gross weight 15,000 pounds; length, 44 feet; height, 14 feet; span, 42 feet.

MiG-19: Another new jet fighter that has been given a "MiG" designation is the MiG-19, although there is no indication that this is a Mikoyan-Gurevich design. Scant information is available on this "flying barrel" model other than that it is a high-performance interceptor and is probably not in production.

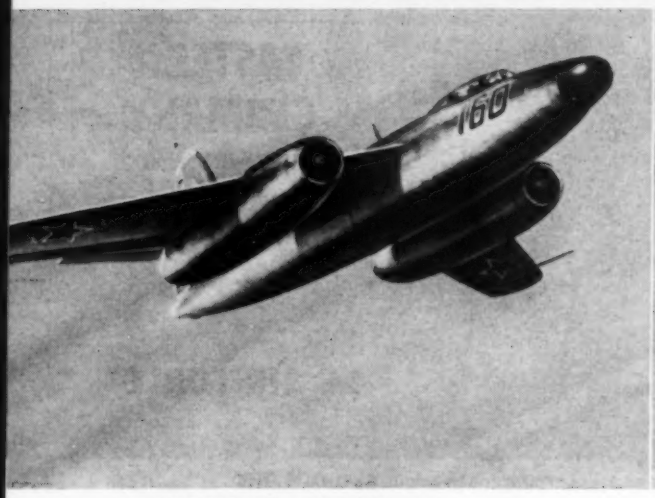
Recently there has been confirmation of reports that the delta wing fighter has not been neglected by the Soviet Union. Most of the work on this configuration is attributed to B. I. Cheranovsky who has been designing all-wing and canard aircraft for almost 30 years. Since the war he has come up with several designs, including a Burnelli-type three-engine transport for carrying tanks.

• **Delta fighter and bomber:** Cheranovsky has, however, mainly concentrated on fighters, and a twin-jet delta fighter reputed to be designed by him is now in production; three pre-production aircraft flew last year. Top speed is well over 650 mph, but landing speed is relatively low—about 80 mph. Length and span are 45 feet.

Work on the prototype of a delta bomber based on the fighter was started last year. Soviet preoccupation with deltas was evidenced by a Radio Moscow broadcast in early November which asserted that an aircraft of this type "designed by Vladimir Vassilchenko" set a new international speed record.

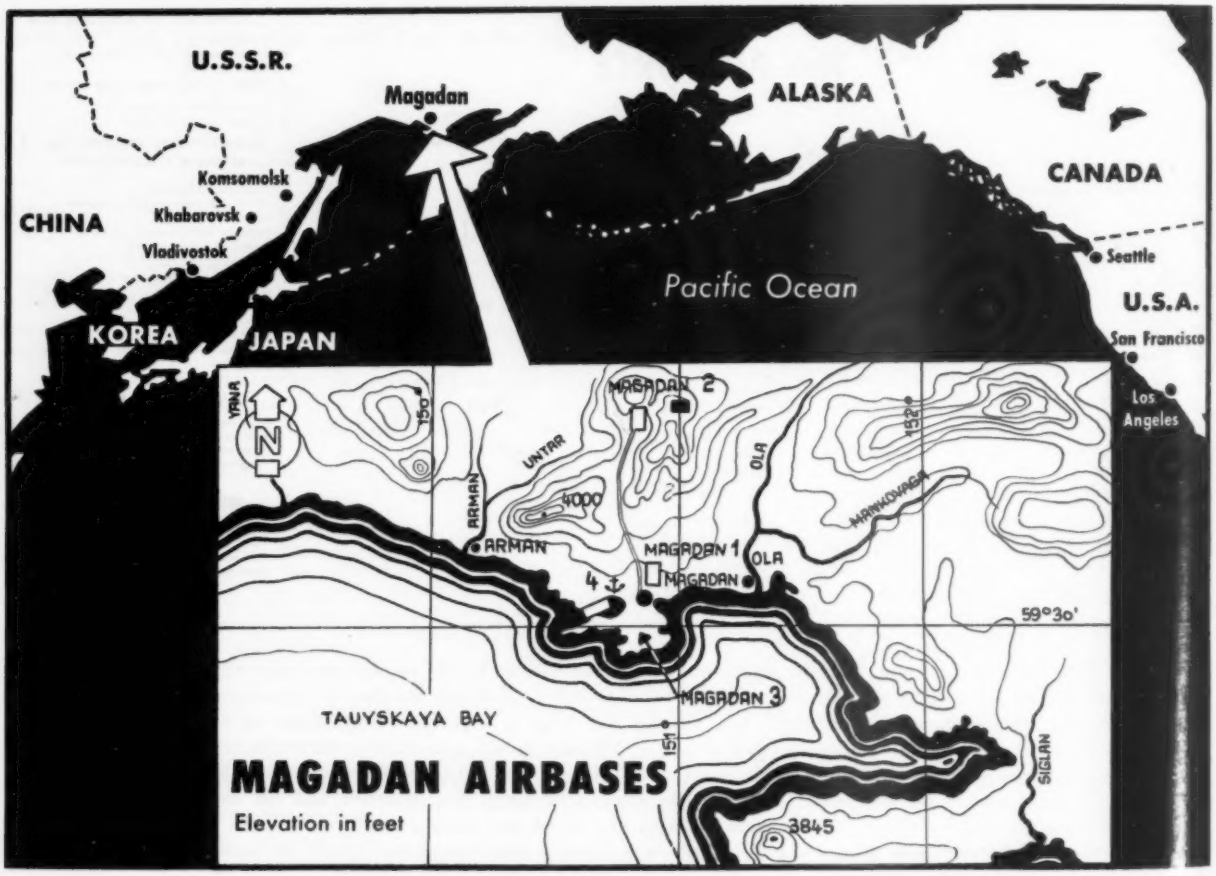
• **Tupolev all-weather fighter:** A twin-engine aircraft which has lately been adapted as an all-weather fighter in addition to its prime role as a light bomber is in large-scale production

THE EXTENT of the Soviet build-up in Eastern Germany is clearly shown on this map, which results from the correlation of information supplied by numerous reliable sources. Although the Red Air Force is still very much to the fore, the emergence of the embryo East German Air Force is apparent. Headquarters of both the Russian 16th Air Force and the East German "air police" are at Wildpark-Werder near Berlin. The Soviet northern air group is headquartered at Finow and the southern group at Grossenhain. The old Luftwaffe supply centers are being revived as production sources for the Soviet Union and the other Communist bloc countries, and the trend is rather to rehabilitate the former German aircraft industry than to start afresh and create a new one. Similarly, the Russians are extending ex-Luftwaffe bases instead of building new ones. Lack of long runways has delayed the extensive introduction of jet aircraft in Eastern Germany.



TUPOLEV all-weather fighter uses a basic light bomber airframe.

THE MIG-19 is a high-performance interceptor. This picture clearly shows its "flying barrel" configuration.



AROUND THE STRATEGICALLY located little fishing village of Magadan are four air bases: Magadan 1, northeast of the village; Magadan 2, north of the village; Magadan 3, under construction south of the village; and Magadan 4, the naval air station on the village's harbor bay (when this bay is frozen over planes use the ice in the area marked with a white rectangle as an alternative base).

under various Tupolev (Tu) designations. The latest swept-wing version has a top speed of over 600 mph and an operating radius of about 600 miles. Other specs are: length, 55 feet; height, 14 feet; span, 50 feet; gross weight, 27,000 pounds.

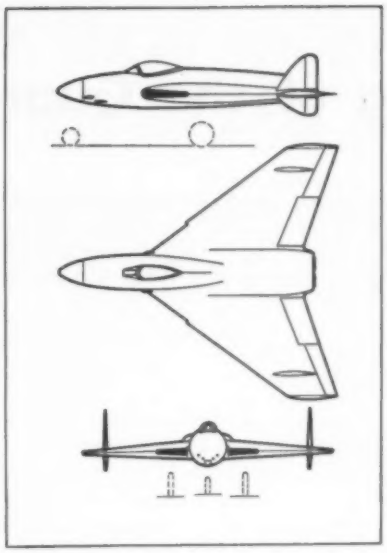
There are several Ilyushin light bombers in the same category as the Tupolev models, but little information is available on them other than their designations—Il-26, Il-27, and Il-28.

• **Model 150:** Further up the scale, in the medium bomber category, is the twin-engine Model 150, described in AMERICAN AVIATION of September 29, 1952. This plane is in full production.

• **Tupolev Tu-25:** In the four-engine jet bomber class a model known as the Tupolev Tu-25 has been mentioned, but the development status of this aircraft is not known, nor are any specs available.

• **Model 31:** Biggest production aircraft of the Soviet Union is a six-engine turbo-prop intercontinental bomber known as the Model 31. An improved version of the Tupolev-Gurevich TuG-75, a prototype model, the Model 31 probably surpasses that aircraft's speed of 470 mph and range of 6,500 miles. Span of the swept-back back wing is 200 feet. Length is 190 feet.

The main assembly line for the Model 31 is in the extreme eastern part of Russia, not far from the Manchurian frontier. The fuselages are being built at Komsomolsk and the few planes—about ten—that have so far come off the production line have been assigned to units in the vicinity of Kharbarovsk, the industrial center of Russia's Far East.



FIRST PRODUCTION Soviet delta-wing fighter, this Cheranovsky twin-jet plane has a "big brother" bomber under development.

Four heavy forging presses have been installed at the aircraft plant on Komsomolsk airfield and others have gone to Kharbarovsk. This does not mean that Soviet aircraft production is being concentrated in far eastern Russia—about 30 other heavy presses have recently gone to factories in various parts of the Soviet Union—but it does mean that the dispersion of the industry has now been extended beyond the Urals.

An indication of the importance which is attached by Moscow to the Russian Far East is the construction of a ring of air bases around the little fishing village of Magadan in the extreme northeastern part of the country that abuts on U. S. territory—the Aleutians.

Its conveniently close position made it one of the funnels through which U. S. aid to Russia was poured during the war. Today Magadan is still a receiving area for military supplies—the latest Russian combat aircraft belonging to crack Red Air Force and naval air units.

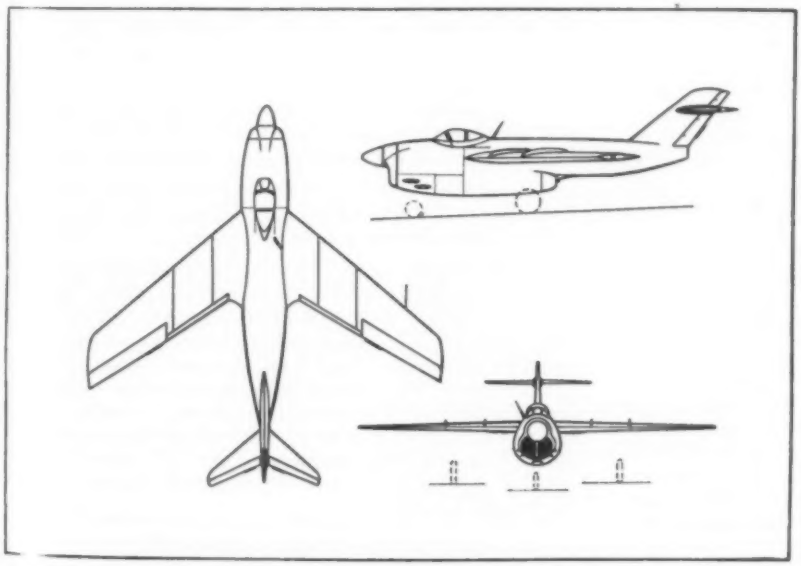
East German Build-up

On the western perimeter of the Communist bloc the build-up is even greater than in the east, with satellite countries providing men, material, and bases to bolster Soviet air power. Not only have the Russians re-equipped their own air force units in Europe with the latest types of jet fighters and light bombers, but they have also started to build the embryo East German air force into a tactical air arm. Known officially as the "Air Section of the People's Police," the resurgent Luftwaffe is being integrated closely with Russia's 16th Air Force, which occupies Eastern Germany; over 300 German pilots have been trained to fly the MiG-15 as part of an 18-month course in the Soviet Union or in the "People's Democracies" of Eastern Europe.

There are now over 1,000 combat aircraft, including 800 MiG-15 or MiG-17 jet fighters, based in Eastern Germany, plus several hundred jet fighters of the 4th Air Force and assimilated Polish units located on the Polish side of the German border. In order to enable more jet aircraft to be based in Eastern Germany, many airfields are being extended. Every major base of the old Luftwaffe has been rehabilitated and a few new fields have been constructed or are being built. A recent trend is the installation of underground facilities so that railroad trains can bring supplies through tunnels underneath the base.

In addition to the development of German bases, the Soviet Union is currently making tremendous efforts to utilize former German aircraft industry facilities in the eastern zone. Not only are attempts being made to get the better-known plants going again (or reconverted to aircraft work) but every effort is being directed toward bringing smaller plants back into the aircraft business. Seemingly armed with a list of the Luftwaffe's component manufacturers and of the factories which built Germany's "V" weapons (guided missiles), the Russians are putting plants throughout Eastern Germany back into the military business.

• • •



THREE-VIEW drawing of the MiG-17 shows the family (Mikoyan-Gurevich) resemblance to the famed MiG-15.

The Changing of the Guard at the JCS

THE ATTENTION of observers of the military scene has been focused, for the past three months, on the appointments of the top civilian leaders of the Department of Defense. With these appointments now largely a matter of history, a new guessing game has started up in Washington military circles—who will head up the military end of the Department?

The composition of the Joint Chiefs of Staff, the top military body in the Department of Defense, is due for a shake-up this year. The terms of office of three of the four members will expire during 1953, with only the Navy representative scheduled to stay on.

First to expire will be the term of Air Force Chief of Staff Gen. Hoyt S. Vandenberg, which is over June 30. Vandenberg may leave before that date, for he will be eligible for retirement on April 30. Gen. Omar N. Bradley's tour as chairman of the JCS will end on August 16, as will Gen. J. Lawton Collins' term as Army Chief of Staff. Chief of Naval Operations Adm. William M. Fechteler has until August 16, 1955, to go on his four-year term.

No. 1 point of interest in the guessing game is who will succeed Bradley as chairman of the JCS; or, more important, from which of the three services will he be drawn? This is of vital interest to the services for it will give one of them a two-man representation on the four-man high command.

Although Bradley's term still has six months to run, observers think that his successor will be named long before that time. Bradley reportedly has frequently stated that he would like to be relieved of his post and it is expected that he will retire before August 16.

There is a rumor floating around that the next JCS chairman must be a Navy man, due to a supposed rotation system for the chair. However, there is no foundation for the rumor; the National Security Act of 1947, which set up the "unified" Department of Defense and created the JCS, established no such rotation system. It states merely that the fourth member of the JCS will be the Chief-of-Staff to the Commander-in-Chief, in other words the President's personal link to the military services.

Appointment of the new chairman will be made personally by President Eisenhower, and it is likely that, with his wide military background, he will need little help in the way of recommendations from the services, thereby putting "Pentagon politics" out of business. Eisenhower is also aware of the importance of the assignment and the type of man needed to keep peace in the military family, having held the post himself on an interim basis during the formative months of the JCS.

Eisenhower has given no indication as to the man he has in mind for the chairmanship, but a number of names are being mentioned in military circles. Each of the services has at least one mentionee. Ex-Secretary of the Air Force Thomas K. Finletter, in his farewell remarks, expressed the hope that the next chairman would be an Air Force man. With the increasing emphasis on air power in the world military picture, this is a feeling shared by many.

Probably the top Air Force officer in Eisenhower's esteem is Gen. Lauris Norstad, commanding general of the Allied Air Forces in Central Europe. Norstad served with the President during World War II and was selected as Eisenhower's top airman when the President went to Europe to take over the North Atlantic Treaty Organization forces. Moreover, Norstad has exhibited a penchant for diplomatic handling of his fellow officers, particularly in the difficult AAFCE post, which would be a valuable asset in the JCS job. Norstad's age (45) and the fact that the AAFCE is his first major command are factors working against him.

The Navy would undoubtedly be somewhat less than enchanted if Norstad, or any other USAF officer, were to be appointed to the top spot. They have hopes for Adm. Arthur Radford, commander of the Pacific Fleet, and they find significance in the fact that Eisenhower stopped off to talk to Radford after his trip to Korea. Radford has plenty of experience, but if he displayed quite a bit of personal courage in the memorable B-36 investigation, he also displayed little diplomacy in public blasting of the USAF, a point which might work against him.

Another prominent mentionee is Gen. Alfred Gruenther, chief of staff of the NATO forces. Gruenther is noted for his planning ability and the JCS is essentially a planning group. But Gruenther's appointment would mean continuance of an Army man in the JCS chairmanship, which is possible but unlikely.

Gen. Collins could also be reappointed as Army Chief of Staff, and he, too, must be considered as a contender for the chairmanship. So must Adm. Fechteler, who will be senior member of the JCS in point of service, unless Collins is reappointed.

Norstad is now considered top contender for Chief of Staff of the Air Force, if he does not get the JCS job or some other special assignment from Eisenhower. Other top contenders: Vice Chief Gen. Nathan F. Twining and Strategic Air Command boss Gen. Curtis E. LeMay. In the Army, Gruenther and Gen. Mark Clark are considered top Chief of Staff possibilities if Collins moves up or out of the JCS. Radford or Adm. Robert Carney, who commands the Mediterranean area, would be the likely candidates for Chief of Naval Operations should Fechteler move up.

The line-up of the JCS is particularly interesting now that budget cuts are looming again, with the attendant increase in interservice rivalry over who gets what share of the defense dollar. Further, there is a possibility of another "Key West conference," to clarify and redesignate the missions and responsibilities of the respective services. One point to remember, though, is that this time there will be in effect a fifth member of the JCS, an ex-officio member whose background is equal to that of any of the other potential members—Eisenhower himself.

. . . JAMES J. HAGGERTY, JR.

In Hartford, too, air travelers can step from the plane into a car from Hertz

here, as at most airports, HERTZ is ready to give your passengers the finest car rental service!

Yes, the **Hertz station** at Bradley Field, Hartford, Connecticut, is just one example of the excellent facilities and superior service offered by Hertz stations everywhere. For your passengers, who expect the best, only Hertz offers them *all* the advantages of car rental service.

Here are the reasons why HERTZ SERVICE is better for the air lines:

- Hertz, and only Hertz, can and does deliver cars to airports in more than 500 cities. Hertz maintains stations right at or adjacent to the airport in most key cities.
- Hertz with 29 years' car rental experience is dependable. It is the world's largest and only international car rental service—uniformly conducted in more than 500 cities throughout the United States, Canada, Alaska, Hawaii, Cuba, Great Britain, Mexico and Switzerland.
- The Hertz national advertising program consisting of full page advertisements throughout the year in Life, Saturday Evening Post, Collier's, Holiday, National Geographic, Time, Newsweek, and U. S. News & World Report, promotes the Plane-Auto Travel Plan, creates new air travelers, puts new business on your planes and builds Hertz popularity.
- Your passengers, reserving cars from Hertz before they take off, can be sure of fine, new cars that are clean and properly conditioned. All gasoline and oil are furnished. Also, Public Liability, Property Damage, Fire and Theft Insurance and $100.00 deductible collision protection are included in the low rate—at no extra cost.
- Your passengers can rent from Hertz day or night for any length of time and enjoy quick, courteous, efficient service. Hertz National Courtesy Cards and International Charge Cards are carried by more than a million and a half men and women and are honored at all Hertz stations.

IMPORTANT!

Encourage your ticket sellers and information clerks to always recommend Hertz Service to your customers. It's the world's finest car rental service . . . and promotion of Hertz Service will pay off in more customer good will and extra business for you. Also, promote this popular service in your national and local advertising, direct mail and counter literature, and other advertising programs.

- Air Travel Cards—are honored at all Hertz stations. They serve as identification, eliminate deposit requirements and provide credit privileges if desired.

For complete information write:

HERTZ *Driv-Ur-Self* **SYSTEM** Dept. C23, 218 S. Wabash Ave., Chicago 4, Illinois · Phone: WEbster 9-5165.

FOR THE FIRST TIME our Research Department, which serves the five American Aviation publications, is now able to extend its services to the aviation industry. This department can survey, conduct projects, and supply reports on such subjects as:

- **Aircraft and Components Manufacturing**
- **Employment Trends**
- **Engineering Research and Developments**
- **Military Aviation**
- **Corporate Aircraft User Group**
- **Business Analyses and Forecasts**
- **Economic, Financial, and Air Traffic Studies**
- **Airline Operations**
- **U. S. Government Regulations**
- **Congressional Trends**
- **International Air Transport**
- **International Aircraft Industry**
- **Air Cargo**
- **Airport Facilities and Planning**
- **Media and Market Data and Surveys**

Inquiries are cordially invited and should be addressed to the Director of Research.

American Aviation
1025 Vermont Ave. N. W.
Washington, D. C.

NEWS BRIEFS

John C. Allen has been sworn in as **Assistant Postmaster General in charge of transportation.** Allen, a former Sears, Roebuck official, replaces John M. Redding.

• •

Outgoing Assistant Secretary of the Air Force **Edwin V. Huggins** has been elected vice president of corporate affairs for Westinghouse. In the newly created position Huggins will take over responsibility for the **wholly owned subsidiaries.**

• •

The half-century mark found **Continental Motors Corp.** solidly in the black. Its 50th fiscal year ended October 31 with **record sales of over $264 million** reported. Net earnings after taxes amounted to $1.85 per share of common stock.

• •

Manager of General Electric's aviation division, **Edward G. Haven,** has been named a **vice president of the SAE** and head of that group's aircraft power plant activities committee for 1953.

• •

William B. Becker has succeeded Leslie O. Barnes as director of operations for the **Air Transport Association.** Becker, who has been with ATA for seven years, was acting director during Barnes' leave of absence when he served with the National Air Transport Coordinating Committee.

• •

William E. Valk has been re-elected president of the Manufacturers Aircraft Association, a group which deals primarily with patenting procedures.

• •

Bell Aircraft Corp.'s **helicopter division** in Fort Worth produced more rotary wing aircraft than anybody in 1952, according to the company. During a single day in December, 12 of the aircraft were delivered. Total employment at year's end: over 2,600.

• •

Although **Northwest Airlines' revenues** in 1952 went up from $54.7 million to a record $60.5 million, the carrier's net after taxes was cut almost in half, falling from 1951's $3 million to $1.6 million. Part of the cause: an increase of $7.5 million in operation costs.

• •

A new division of the **Flight Safety Foundation** has been established the Division of Aircraft Service and Equipment. It will be directed by **Joseph M. Chase,** formerly aviation manager of the Lumbermen's Mutual Casualty Co.

AIR FRANCE

The **LUXURY** *World-wide Airline*

is using THE American MAGAZINE

in launching its

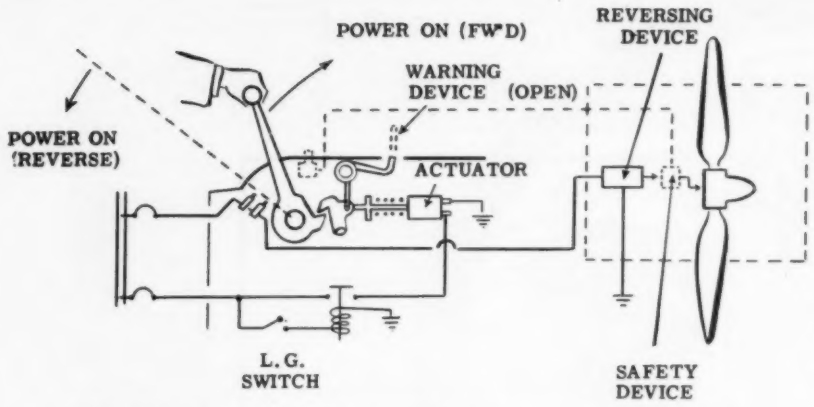
Largest Advertising Campaign

Air France, the world's largest airline, is using pages in full color in The American Magazine this spring. Air France will be telling its story of luxury air travel linking all six continents with 145,000 miles of routes to The American Magazine's 10,230,000 travel-conscious readers.

The American Magazine delivers actual travelers. A recent survey of American readers writing for travel literature showed that 9 out of 10 traveled during the past year, with 34% journeying outside the United States, and 10% visiting Europe.

More travelers than ever before are flying **AIR FRANCE.**
More and more travel advertisers are using The American Magazine.

Crowell-Collier Publishing Co., 640 Fifth Ave., N. Y. 19, N. Y. Publishers of The American Magazine, Collier's, Woman's Home Companion.



SAFETY DEVICES in typical propeller reversing system may be supplemented by added reverse safety feature (dotted line) incorporated in propeller governor, if equipment passes test in actual airline operation.

Reversing Props: How Safe Can You Get?

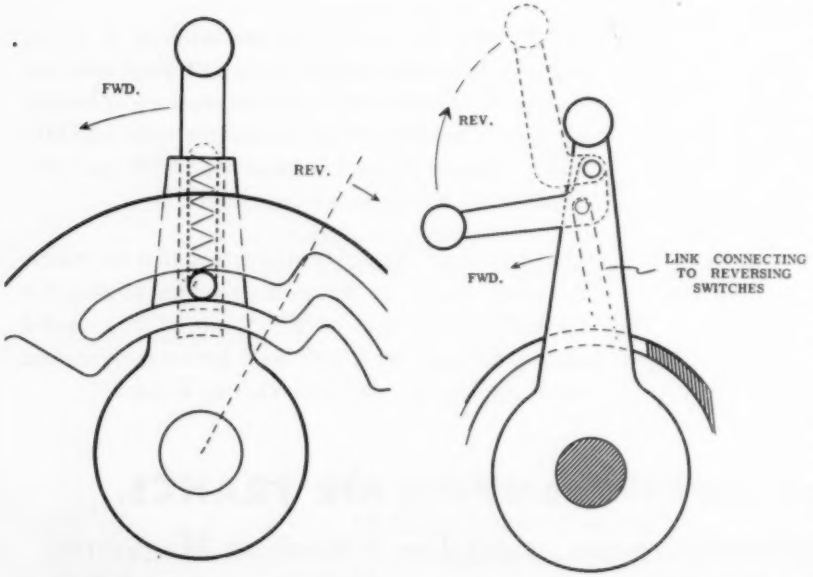
Airlines are set for a showdown on the whole problem of new safety devices and airworthiness directives.

By JOSEPH S. MURPHY

THE HIGHLY controversial issue of propeller reversing safety, which has been simmering in the background since early in 1952 following the last of the Elizabeth, N. J., accident series, boiled rapidly toward a climax last week as the airlines organized their forces for a last-ditch stand against a CAA proposal that several more modifications be made mandatory.

But the airline stand is not merely on the issue of whether or not a recently developed Hamilton Standard decrease pitch relief valve (AMERICAN AVIATION, January 19) is a valid subject for a CAA airworthiness directive, or whether a lift-type throttle or similar arrangement should or should not be required.

• To the airlines, the real issue at stake is how many safety devices on top of safety devices they will be made to install. Or in short, "Just how safe is safe?"



DETENT TYPE throttle most widely used now may give way to "lift type" throttle shown at left, above, or auxiliary reversing levers of type at right.

Pressing for adoption of the proposal from the other side of the table is the Air Line Pilots Association, whose interest in this particular issue goes beyond that of awaiting the design of an improved safety device to end all unwanted reversals, since ALPA's Charles Daudt, American Airlines pilot, sponsored the design of a similar reversing system that ultimately led to the Hamilton Standard governor rework.

In the middle is CAA's Office of Aviation Safety, headed by Ernest S. Hensley, who, along with the Civil Aeronautics Board, was the target of criticism on this same propeller reversal issue last October, in a *True* magazine article titled, "The Secret Gamble That Can Kill You." In its lap will fall the final decision..

To the airlines who will unify their stand in opposition to the airworthiness directive through the Air Transport Association, this general issue of degrees of safety could well be applied to the whole broad subject of airworthiness directives and not remain confined to the immediate issue of propeller reversing systems. But the prop reversal problem is one that probably best exemplifies the airlines' objections.

Two Objections

• For they have spent the better part of this past year isolating the reversing circuits to prevent the condition that the new CAA proposal will doubly protect against.

• And they have consented to the all-out installation of reverse pitch warning lights to warn the pilot immediately, when and if an unwanted propeller reversal should occur.

On top of these reworks, the first of which was the subject of a mass release of airworthiness directives in July of 1952 and the latter a proposed Civil Air Regulation whose adoption is a foregone conclusion, the CAA proposes these new modifications:

• Installation of the Hamilton Standard decrease pitch relief valve, providing for its actuation by the pilot manually after the airplane has touched down during a landing.

• Throttle mechanism modification, so that a motion "unmistakably different" from that of closing the throttles is required to apply reverse power.

The airlines are not standing their ground on an issue devoid of economics. Exclusive of the throttle modification on which little data is available, the governor rework kit for each engine is expected to cost about $700. Added to this, according to one airline's estimate, is another $500 per governor for the engine, aircraft, and cockpit modification, or a grand total of $1,200 per nacelle.

• • •

when they buy aviation supplies and materials from Air Associates because—

They can reduce inventories of standard parts and supplies.

Numerous parts needed from many suppliers are covered by *one* order . . . *one* delivery . . . *one* bill . . . *one* payment.

Deliveries are made to subcontractors' plants from convenient locations.

These Aviation Supplies Divisions of Air Associates are backed by 25 years of experience in meeting the requirements of the aviation industry:

216 Union Street, Hackensack, N. J.
5315 West 63rd Street, Chicago 38, Ill.
3214 Love Field Drive, Dallas 9, Texas
1231 Air Way, Glendale 1, California
International Airport, Miami 48, Florida

Manufacturers and Distributors of Aviation Materials and Equipment

AIR ASSOCIATES

GATHERED in Rynel's Twin Beech are Stetler B. Young, vp; Bruce Watson, pilot; A. A. Gareri, vp; and John M. Stager.

Rynel Grew Fast with Corporate Planes

Backlog multiplied ten times during month after gear company bought its first aircraft.

By Lois C. Philmus

CORPORATION aircraft are too often associated with million-dollar companies; very little has been said on how the use of aircraft can help a small company grow. One such case is that of the Rynel Corporation in Sterling, Illinois. The company was organized just seven years ago to manufacture fine pitch gears and boasts a capital investment of $52,000.

About two years ago the company bought its first plane—a Navion. At that time, thirty-five people were employed and the company, because of its off-beat location, was restricted in its selling to the Chicago area. Sterling, about 125 miles from Chicago, has once-a-day train service and no airline service at all.

Before the plane was put into service the physical assets of the company were worth about $125,000. Today, just two years later, the total is well over $600,000.

The company's backlog soared from $30,000 to $300,000 within 30 days after the plane was bought; today the backlog is a healthy $3 million. Of this total only 30% is defense production, with the bulk of Rynel's output going to civilian markets. Employment has tripled.

Over this two-year period, the Rynel company purchased a Twin Beechcraft to supplement the Navion and just recently an Aero Commander. Although the planes represent a high financial investment for the company, Stetler B. Young, first vice president, estimates that the planes cost only 18c on the earned dollar.

Aviation gets full credit for this tremendous expansion in the company's business. Because of their use of aircraft, the company's salesmen were able to expand their activities throughout the country. Rush orders can be personally delivered within 24 hours. Engineers needed in customers' plants for consultation can arrive on the scene the same day they are called.

2,280 Hours per Year

Today the company planes fly a total of approximately 2,280 hours per year, averaging 50 hours per month for the Navion, 60 hours for the Beech, and 80 for the Aero Commander. Chief Pilot Leslie Meggers, a veteran of 4,000 hours with five ratings, is in charge of the aircraft and is assisted by Bruce Watson, who has logged 3,400 hours.

The planes make at least three flights a day to Chicago and frequently cover points in Minneapolis, Cedar Rapids, Detroit, Fort Wayne, Binghamton, N. Y., and Dallas, where customers are located. In other words, the use of aircraft has allowed the company to grow from a strictly regional operation to a nation-wide one.

To further reap benefits from its aircraft investment, Rynel has been running a series of ads in trade and business publications interested in its product to the effect that salesmen, executives, engineers and gears are at the customer's service the day they are needed.

Young summarizes the results by saying, "The whole key to our success is expanded communications. Our men can get to the potential customer and we can bring customers back to investigate our facilities, for wider and closer relationships." Time saving and territory expansion have resulted.

Rynel would continue operating its own aircraft even if airline service were instituted in Sterling, because Young estimates that at least 90% of the towns where manufacturers are located are too small ever to be served by the scheduled carriers.

In order to keep flying and to continue doing business despite marginal weather, the planes are equipped with the best of navigation and communication equipment.

The Twin Beach has a Western Electric LF receiver, ARC omni, ARC ILS, Bendix ADF, two transmitters, dual VHF 17 C and marker beacon. The Aero Commander has ARC omni, ARC ILS, Bendix ADF, dual transmitters, receiver and marker beacon. The Navion Super 260 has Narco omni, RCA LF receiver, and a dual RCA VHF transmitter.

A custom interior in the Twin Beech, designed by Butler & Zimmerman of New York City and installed by Gopher Aviation of Rochester, Minn., has made the most of working facilities. Four passengers can be carried and there is working space for all. The pilot's compartment is roomy and comfortably allows for a pilot-copilot team. The Aero Commander will be similarly designed.

To keep the planes in flying order at all times, Rynel has a contract with Gopher to do all its overhaul and maintenance work.

Probably the best way to sell aircraft as a business tool is to talk to the Rynel Corporation executives. Credit for the rapid growth of the company goes entirely to the airplane. Some certainly should be reserved for the far-sighted attitude of the men involved. • • •

Henry Bonanza VP

Bonanza Air Lines has made its general counsel, G. Robert Henry, executive vice president with authority in all management affairs. Henry, former member of CAB's legal staff who later had his own practice in Washington, will continue to act as general counsel for the line.

Sign of a good time to fly

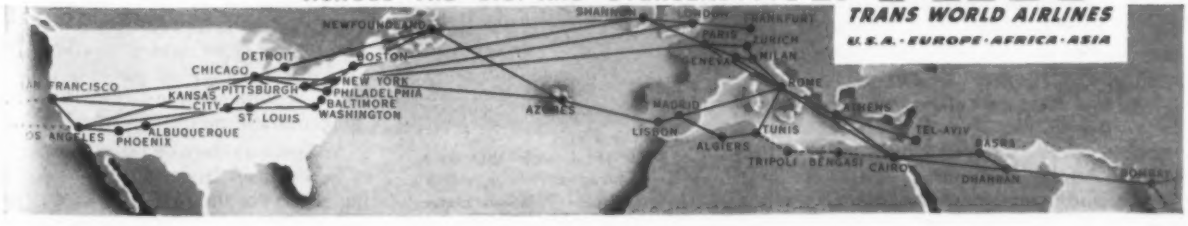
Don't let your winter travel plans bog down in ice and snow. Take to that wide, clear road at the "fair weather level" where TWA Skyliners fly. With surface storms and icy going far below, relax—and watch your travel problems melt away in the warmth of world-famed TWA hospitality. Next trip, whether your destination is across the U.S. or overseas, try TWA—and you'll never again let winter get you down!

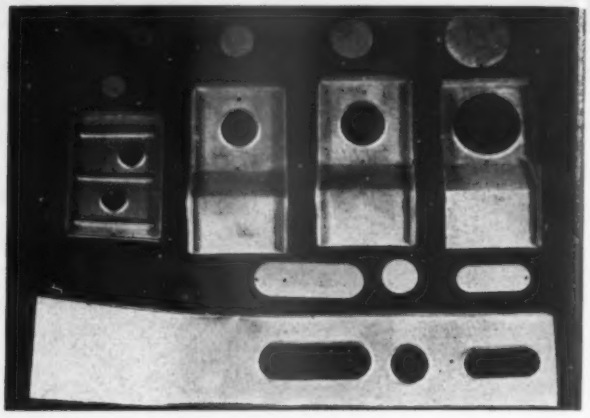
Where in the world do you want to go? For information and reservations, call TWA or see your travel agent.

ACROSS THE U.S. AND OVERSEAS... FLY **TWA**

TRANS WORLD AIRLINES

U.S.A. · EUROPE · AFRICA · ASIA





$20,000 WORTH of titanium is in two-ton ingot at Rem-Cru. Typical punch press parts in commercially pure titanium are shown at right.

Titanium: Out of the Lab, into Production

"Wonder metal" is going into supersonic prototype and F-86; production climbs toward 1955 goal of 22,000 tons.

By William D. Perreault

TITANIUM, the infant metal which combines the strength of steel with weight which compares favorably with aluminum, is coming into its own in the production of aircraft and engines. This is the titanium production and use situation today:

• **A supersonic plane** now in the design stage will be built largely of titanium.

• **North American** is using titanium to replace 18-8 stainless steel in fuselage skin adjacent to F-86 Sabrejet engines, also in firewalls and other heat shields to the sum total of 600 pounds per plane.

• **Engine manufacturers** are using titanium in forgings and such critical trouble spots as pinions, gears, splines, and similar parts. In one application in a jet engine compressor wheel, use of titanium rather than steel cuts the weight from 30 pounds to 18 pounds, while increasing the bursting speed from 17,000 revolutions per minute to 25,000 rpm.

• **Titanium production** is up to five tons per day, and construction of facilities for producing up to 20 tons per day is under way.

• **By 1955 annual tonnage** of titanium will be up to 22,000 tons, according to present plans. This compares with 10 tons in 1948 and 1,000 tons in 1952.

• **New titanium alloys** with improved crystal structures will soon be available to provide better weldability and hot strength, especially useful in aircraft and engine applications.

These are some of the main points disclosed to the Society of Automotive Engineers in its recent meeting in Detroit. Four speakers, each covering a specialized phase of titanium interests, brought the SAE members and guests up to date on production and use of titanium.

In a paper titled "The Bases for Tonnage Titanium Production," C. I. Bradford, director of operations with Rem-Cru Titanium, Inc., outlined the problems and rewards of titanium production. Still the major deterrent to wide use of the lightweight metal is its relatively high cost: $10-$20 per pound. This minimizes substitution except where absolutely necessary because of heat or corrosion problems and at the same time discourages experimentation leading to new, economical applications.

FIRST SUCCESSFUL wide, thin titanium strip produced anywhere, 0.015" x 36" by 460 feet is shown above.

Some of the major accomplishments in titanium production, as seen by Bradford, include current production of five tons of metal per day with facilities for production of 20 tons per day under way; improved quality control, made possible in part by increased ingot size, which has now gone as high as two-ton units; availability of reliable alloys in virtually all the standard forms in which stainless steel is produced; and accomplishment of continuous wide strip processing (see photo).

Virtually all commercial titanium-base alloys available thus far have been a combination of two crystal structures, alpha and beta. Each of these types has its own advantages, which Bradford summarized in this manner:

- **Alpha:** all around performance including good weldability, strength both cold and hot, and resistance to oxidation; it is a bit muscle-bound in bending.
- **Beta:** provides excellent bend ductility, strong both cold and hot, but vulnerable to contamination and a big consumer of strategic alloys.
- **Combined Alpha and Beta:** for compromise performance; has good bendability, is strong cold and warm, but weak hot; has moderate contamination resistance, but excellent forgeability.

Rem-Cru will soon introduce an Alpha type alloy which should prove particularly useful to the aviation industry because of its improved characteristics over the presently available alloys.

Maximum benefit from titanium is to be expected from specifically designing a part for the new alloy rather than

One of the Navy jet fighters of most advanced design, the Douglas XF4D "Skyray" is equipped with H2 non-inflammable hydraulic fluid.

First developed for new Navy fighters, now ready for commercial use...

HOLLINGSHEAD H2®

non-inflammable hydraulic fluid

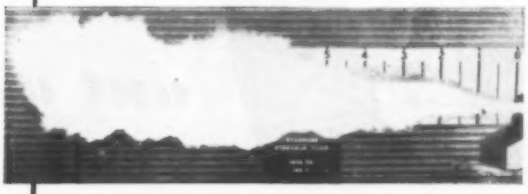
Here's a truly non-inflammable hydraulic fluid, a fluid with *a flammability rating of zero*—now available to bring extra safety to all planes. Hollingshead H2 non-inflammable hydraulic fluid was developed to meet Navy specifications. In addition to its great safety factor, it either meets or exceeds existing standards to insure satisfactory operation and life of the hydraulic system.

The proven dependability and safety of H2 non-inflammable hydraulic fluid have a place in your operations. Write to Hollingshead for full details.

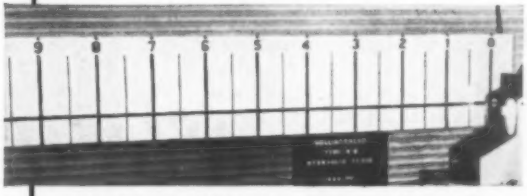
More Advantages—Not necessary to change "O" RINGS, SEALS, OR ACCUMULATOR DIAPHRAGMS. The fluid conforms to Specification MIL-F-7083 (AER). BETTER LUBRICITY and HIGHER SPECIFIC HEAT reduce parts wear. IMPROVED VISCOSITY in operating range from below –60°F. to 160°F. INHIBITED to protect against corrosion. LOWER COST than any similar fluid available.

WON'T BURN!

CAA tests show safety factor



THE DANGER OF FIRE from a regular hydraulic fluid is clearly seen here. The fluid was sprayed under a pressure of 3000 psi through an acetylene flame of 6300°F. A 10-foot flame shoots out.



NO FIRE OCCURS when H2 non-inflammable hydraulic fluid undergoes the same test. The CAA Technical Development and Evaluation Center, Indianapolis, made the test and gave the fluid a flammability reference number of zero!

Booklet contains details
Send for a copy of this new booklet which gives a complete description of H2 including data charts and servicing information.

Industrial Division *R. M. Hollingshead* Corporation

Leader in Maintenance Chemicals

840 Cooper Street, Camden 2, New Jersey

# of ALL the world's International Airlines*

7 out of 10 use

ESSO

AVIATION PRODUCTS

The ESSO winged oval, symbol of leadership in aviation petroleum service, is backed by more than 45 years of aviation experience including many pioneering achievements.

It was an ESSO refinery that supplied the gasoline for Orville Wright's historic flight at Kitty Hawk, North Carolina on December 17, 1903. Since then, ESSO Aviation Products have played an ever-increasing part in the advancement of aviation.

In 1944, the first aviation engine test unit, specifically designed to test fuels and lubricants in full-scale aircraft engines, was inaugurated at the ESSO refinery in Bayway, N. J.

Meeting the exacting requirements of modern air transportation, ESSO marketers were also the first to develop and expand the use of the Hydrant Refueling System. Today, even at such widely separated airports as Gander (Canada) and Don Muang (Thailand), the ESSO winged oval guarantees safe, fast, dependable petroleum service to all aircraft.

Around the clock, around the world ESSO Aviation Products are available where you want them, when you need them.

ESSO

A GOOD SIGN TO FLY TO

*As listed by: C.A.B. "World Directory of Airlines" and international aviation trade press

simply replacing an existing metal with titanium. Titanium's density permits a 40% reduction in weight when it can be substituted section for section with ferrous alloys.

Tonnage production will bring with it lower costs. At present the largest ingots, 4,000 pound size, cost $20,000. These large ingots also provide more uniform temperatures and less time at high temperatures where contamination is likely.

Two principal producers of pure ductile titanium sponge are DuPont and Titanium Metals Corp., with daily production of about four tons. Melting capacity is in excess of sponge capacity, with Rem-Cru alone having five-ton-per-day capacity. The increase in production to 20 tons per day will be brought about by new plants at Newport, Delaware, and Henderson, Nevada.

The requirement for titanium, according to F. Robert Kostoch of North American, is in the temperature range from 250° Fahrenheit to 800° F. Today the main source of this type heat is the engine, and titanium has proved most useful to North American in the fuselage skin adjacent to the buried engine of the F-86.

Weight Problem

Stainless steel, formerly used, was becoming a critical weight problem as increasing power requirements raised strength requirements and weight. North American is using commercially pure titanium in this application today. Such alloys are available with yield strength of 80,000 psi and 90,000 psi ultimate. This is low compared to commercially available titanium alloys with twice this strength.

The future holds an even more important amplication for titanium. At a speed of Mach 2 and 35,000 feet altitude, Kostoch calculated, skin temperatures reach 600° F. Since this is the limit for high strength aluminum alloys, attainment of these speeds will call for fuselage and wings of titanium. Even present day titanium will not meet the top requirements, but future alloys may fill the bill.

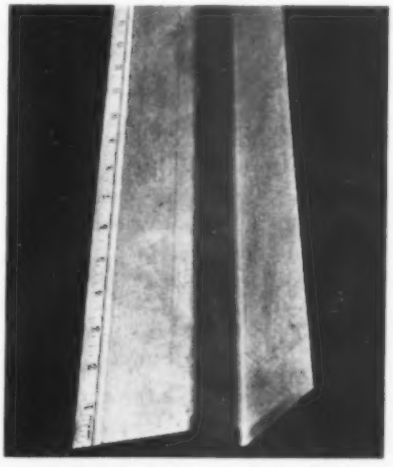
Kostoch shared some of the problems and findings of North American in working titanium, which the company is now using in sufficient quantity for full production fabrication. To minimize working problems and reduce material costs, NAA has concentrated on use of titanium sheet and kept experimental work to a minimum.

"One of the most successful forming methods," NAA found, is stretching. A stretch job with a "good contour" can be obtained with equipment such as a 60-ton Hufford stretch press, the company found. Best results were obtained when sufficient stretch could be given to the outside flange to move the neutral axis as close to the inside flange as possible, in order to make the compression shrink small.

SOME 600 POUNDS of titanium go into the North American F-86 Sabrejet.

North American concluded, after successfully fabricating titanium by punch and draw press, brake, drop hammer, stretch press, hydropress, and hydroform, that titanium does not like to be "pushed around rapidly." Other North American experience and conclusions:

- **Due to failure to develop** a reliable production method for fusion or resistance welding, NAA has relied on riveting and bolting parts. Weld joints can be made but result in brittle condition, minimized by postheating but not simply accomplished.
- **High chemical activity** of commercially pure titanium in the molten condition will probably limit welding to inert gas shielded arc welding.
- **Most sheet stock** bends fine from one surface but fails when bent from the other; reason is still doubtful, but pickling with nitrichydrofluoric dip reduces failures.



90° Z SECTION formed by simple brake operation. Lower bend was successful but reverse bend failed at about 35 degrees.

Substantial weight savings in engines will result from increased use of titanium in pinions, gears, splines and other moving parts, according to General Electric Co.'s L. R. Frazier, but such applications must await a suitable surface hardening procedure, such as plating or case hardening.

While high strength alloys, such as Mallory alloy with three Al, five Cr, might find such applications as these in engines, low strength alloys can be used for forged or rolled parts not requiring high strength. Forging of low strength titanium alloys for bearing housings has also been successful, despite the requirement for intricate machining and precision grinding operations.

Some other G-E conclusions and findings:

- **There are forging problems** peculiar to each alloy. Ti 150A, which has a good balance of properties, requires understanding and precision in forging, heat treating and fabrication.
- **Grinding must be done** without deviation from recommended speeds, wheels, and coolants.
- **Ductility** is an important requirement for all rotating parts, with less ductile titanium discs bursting at lower speeds regardless of strength. • • •

ACTA to Name Head

Aircoach Transport Association, trade group for 37 non-scheduled airlines, is meeting this week to name a successor to Amos E. Heacock, whose resignation as president was scheduled for February 15. Heacock, whose resignation was accepted by ACTA's board of directors with "deep regret," left the group to devote more time to his own non-scheduled airline, Air Transport Associates, which is tied up in a fight with CAB now before the U. S. Supreme Court.

DEMAND–not distance–defines your market potential

See how Airfreight can put your product in new and once too distant territories

No matter where demand might exist, today, that place can be *your* market. This and this alone should be the guiding principle when determining new markets for your product. No longer do time and distance become major considerations when you ship by air and measure miles by minutes rather than hours.

Such streamlined distribution methods enable you to open up new sales territories formerly out of reach. Invade rich established markets and compete there successfully against local manufacturers.

More than a better way to ship, Airfreight is actually a new and better way to do business. Why not find out what this modern method of distribution can do for you? Let an American Airlines representative tell you the story of Airfreight in terms of your business as soon as possible. For complete information, wire collect to American Airlines, Inc., Cargo Sales Division, 100 Park Avenue, New York 17, New York.

AMERICAN AIRLINES INC.

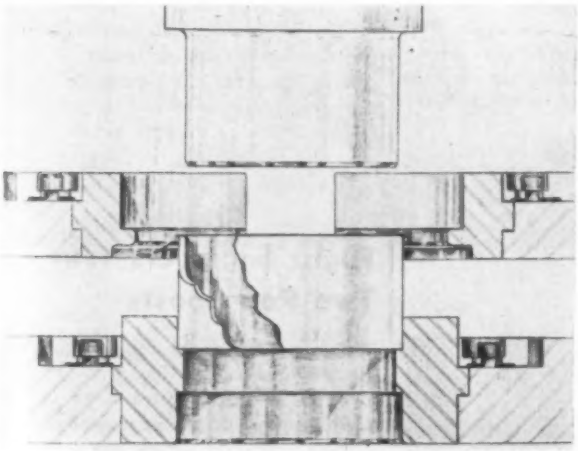
America's Leading Airline

OLD WAY, machining from tube stock, involved parts shown at left, above; loss in shavings was sometimes as much as two pounds of stainless steel. At right are shown the strip stock now used, before and after it is welded into a sleeve, and the finished part (front, center).

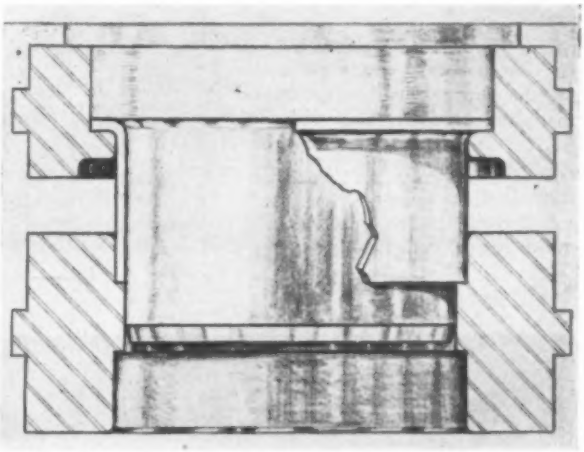
Northrop Punch Hits The Jackpot

NEW WAY involves use of punch press and cam action dies shown above. In this picture the punch has not yet been lowered and the top set of dies is still open. At the right are parts that have been finished; on the sub-bolster in front are welded sleeves not yet shaped.

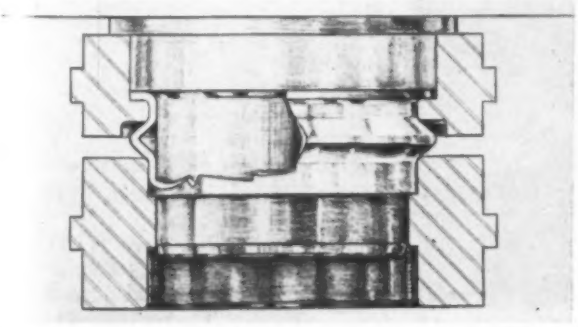
MILLION DOLLAR stroke of luck for Northrop was the development of method shown here for producing duct ends for the hot air system of the F-89 Scorpion by using punch press and cam action dies. Parts had formerly been machined with waste of both time and metal. Now what was sometimes a three-hour job is done in less than five minutes. Method for producing the stainless steel parts to close tolerances (0.010 diameter and 0.005 concentricity) is credited to Northrop tooling engineer Edwin A. DeVoss. Saving: $1 million.



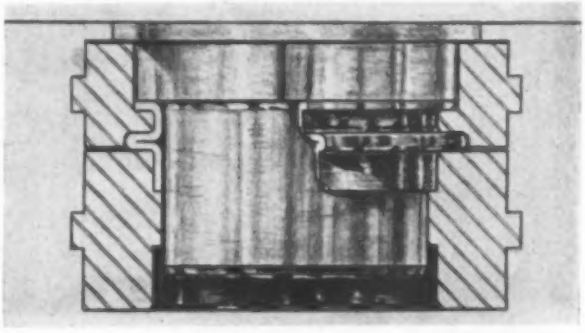
1. SLEEVE is in position in diagram above, resting on stationary bottom dies. Top dies are held open by springs.



2. PUNCH DESCENDS and top dies close in. Top edge of sleeve is forced outward, forming a flange. Flange fills die.



3. SLEEVE BUCKLES in unsupported area as punch and top dies continue to descend, thus beginning formation of bead.



4. COMPLETE BEAD is formed as top dies come to rest. Punch then is pulled up and out of part, part is removed.

ANDB Building Traffic Control Center

Study of new systems and devices will be pushed in building under construction at Indianapolis.

FOR SEVERAL YEARS now the Air Navigation Development Board, working with CAA and the industry, has been directing the industry's efforts at building new systems and specific equipment for improved air traffic control. Starting July 1, 1953, ANDB will have a new Airways Operations Evaluation Center where these devices and systems will be "molded into a single machine for air traffic control."

In disclosing its newest step in implementing the "Common System" programmed by the Radio Technical Commission for Aeronautics, ANDB let a contract for approximately $200,000 to the Bell Telephone System. Bell will handle systems engineering for the new center in cooperation with CAA engineers.

The single facility, incorporating a regular operating control center plus the evaluation center, will be housed in one building at Indianapolis. This building, now under construction, is alongside the present CAA research center, which is now using the air traffic simulator in allied testing. No decision has been made on a director for the new facility but indications are that, because of its close alliance with CAA's Technical Development and Evaluation Center, direction will come from that organization.

Projects to be conducted by the evaluation center include use of automatic air traffic data display equipment, data transfer and storage equipment, radar displays from remote sites along the surrounding airways, and completely new automatic switching facilities for interphone, teletypewrite, and radio communications systems.

Specific equipment scheduled for early incorporation includes:

• **Magnetic storage system:** equipment is scheduled for July delivery from Engineering Research Associates, in Minneapolis, the firm that has designed and built it. Traffic control data fed to the magnetic drum is stored there until the controller is ready to use the information.

• **Data display & transfer board:** under development for the past three years by Union Switch & Signal Co.; will be used to transfer complete traffic control data from one control center to another as a plane flies out of the control area of a given center and into another. This is now handled by multiple phone calls with large time loss and room for error.

• **Automatic teletype switching equipment:** will probably be bought "off the shelf" and will tie together the rest of the equipment.

Major purpose of this equipment is to ease the human load while eliminating the room for human error in the complex business of air traffic control.

ANDB and CAA have taken particular care in pointing out that the newly established control center at Indianapolis, formed by taking three air traffic control sectors now assigned to other centers, will not be involved in any experimentation. Their close proximity, within the same building, will permit the evaluation center to be in close touch with the requirements and problems of ATC while working out solutions to the problems.

As development equipment reaches a stage where operational tests are required it can be moved physically into the control center and operated in parallel with existing manual systems of control without sacrificing safety.

Bell Telephone System has two main areas of responsibility in the new AOEC. Through Western Electric contract, at ANDB expense, Bell will handle systems engineering planning for the traffic control equipment at Indianapolis and at some future date for other centers. Another phase of Bell's work, at its own expense, will be to develop and improve communications services to keep pace with the rapidly changing needs of aviation as the new systems of control are introduced.

As the program progresses the AOEC will study such matters as the functions and time utilization of controllers and other CAA personnel, study communications as related to traffic control, and seek to improve present facilities while awaiting the day of wide scale application of new systems. • • •

Western Air Lines' new Douglas DC-6B has been put into service on the Pacific Coast. The luxury airliner carries 66 passengers, has a top speed of 360 mph, and features a "symphony of the west" interior.

Flight Engineers Win Two Pay Boosts

The AFL-Flight Engineers International Association has won the first two rounds in its attempt to get its members paid on an increment and incentive basis, like airline pilots, instead of straight monthly salaries.

One contract, between FEIA and Eastern Air Lines, gives the flight engineers on EAL's Constellations increasing hourly pay for every 25 mph increase in speed plus ½c for every mile flown monthly up to 17,000, a penny for every mile between 17,000 and 22,000, and 1½c for all miles over 2,000.

Another pact, between FEIA and United Air Lines, also provides increasing pay for higher speed brackets for engineers on UAL's DC-6B's, but pays them at the rate of 0.00725c for all miles flown. FEIA officials believe the two contracts will provide roughly equal pay hikes.

Nearing 100 million miles of luxury service

Boeing Stratocruisers brought double-decked luxury to the airways of the world. And in the four years they have been in service, Stratocruisers have become staunch veterans of nearly 100,000,000 miles of dependable travel on civilian routes alone. During this period, more than 1,750,000 passengers have traveled aboard the big Boeings.

Over-ocean flights to the Orient, Europe and Hawaii are a day-in, day-out routine to this speedy queen of the airlines.

The Stratocruiser inherits the proud tradition of such earlier Boeing airliners as the 247, America's pioneer all-metal, twin-engine transport, the famous 314 Flying Boat, and the 307 Stratoliner, as well as historic military aircraft such as the Flying Fortresses and Superforts of World War II.

Today Boeing is amassing an unmatched backlog of experience in the field of large, multi-engine jets, through the B-47, first airplane of its size to enter the over-600-miles-an-hour class, and the giant new B-52 eight-jet heavy bomber. These two planes have given Boeing over 14,500 hours of jet wind tunnel research, and over 5000 hours of jet test and research flying.

Out of this unparalleled experience, Boeing's prototype "Project X," America's first-announced jet transport, is being developed. This company's 36-year history of imaginative engineering, of design and production integrity, gives promise that Boeing's jet transport will be another outstanding aircraft.

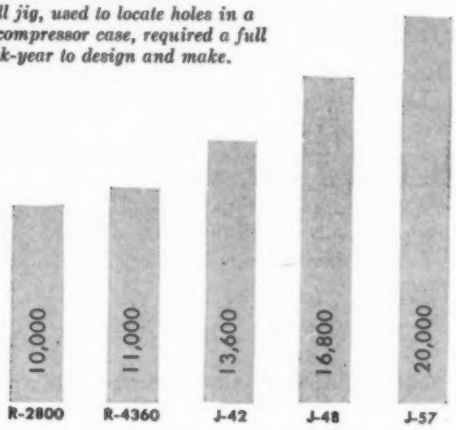
Fleets of Boeing Stratocruisers are in service on **Pan American World Airways, United Air Lines, Northwest Airlines** and **British Overseas Airways Corporation.** For the Air Force, Boeing builds the B-50 Superfortress, B-47 Stratojet, C-97 Stratofreighter and the B-52 Stratofortress.

BOEING
STRATOCRUISER

20,000 TOOLS TO BUILD

FIRST J-57 TURBO-WASPS

This drill jig, used to locate holes in a turbojet compressor case, required a full man-work-year to design and make.



This chart illustrates the drastic increase in tooling requirements from piston engines, to early jets, to the mighty axial flow jet, the J-57. Production tooling is, of course, only one of the complex phases of building jet engines. But the relationships illustrated here are typical of all phases of design, development and production.

Everyone concerned with aircraft production knows that a modern military airplane is more complex than its World War II counterpart.

But how many, we wonder, realize *how much* more complex it is?

For instance, take the engine, the heart of any aircraft. As just one measure of how problems have increased in powerplant development, we show above the number of *special* tools, jigs, dies and fixtures required to produce various Pratt & Whitney engines to the point at which they passed their 150-hour type tests.

Each of these tools had to be designed and made—*and made to work*—before the engine in question could itself be manufactured. There were 10,000 such special tools required for the R-2800, one of the most powerful piston engines of World War II. Today, 20,000—just twice as many—are required for the J-57 Turbo-Wasp!

While tooling is only a single phase of jet engine production, it illustrates the complexity of the entire industry's problem. It also helps demonstrate why—today as always—*dependable engines take time to build.*

Pratt & Whitney Aircraft

MAIN OFFICE AND PLANT: EAST HARTFORD, CONNECTICUT
BRANCH PLANTS: NORTH HAVEN, SOUTHINGTON, MERIDEN

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

Overhaul Contract To British Firm

A $2,000,000 contract has been placed by the U. S. Air Force in Europe with a British company, Field Aircraft Services Ltd., for the overhaul of Douglas C-47 transports and their Pratt & Whitney engines. This is the biggest contract ever awarded by the USAF to a European firm.

Daily Utilization

Domestic Carriers

Average Revenue Hours of Use Per Day Per Aircraft

		Quarter Ending Sept. 30, 1952
American	2 eng. pass.	6:35
	4 eng. pass.	9:52
	cargo	3:47
Braniff *	2 eng. pass.	6:34
	4 eng. pass.	8:55
	cargo	9:01
Capital	2 eng. pass.	7:24
	4 eng. pass.	8:34
Caribair	2 eng. pass.	4:19
	cargo	3:00
C & S	2 eng. pass.	9:07
	4 eng. pass.	9:26
Colonial	2 eng. pass.	7:55
	4 eng. pass.	8:49
	cargo	8:28
Continental	2 eng. pass.	7:11
	4 eng. pass.	4:59
Delta	2 eng. pass.	8:22
	4 eng. pass.	8:53
	cargo	6:31
Eastern	2 eng. pass.	7:05
	4 eng. pass.	9:23
Hawaiian	2 eng. pass.	6:57
	cargo	4:11
MCA **	2 eng. pass.	6:09
	4 eng. pass.	2:20
National	2 eng. pass.	7:19
	4 eng. pass.	10:14
	cargo	5:57
Northeast	2 eng. pass.	7:32
	4 eng. pass.	7:23
Northwest	2 eng. pass.	8:32
	4 eng. pass.	9:35
Trans Pac.	2 eng. pass.	8:12
TWA	2 eng. pass.	4:02
	4 eng. pass.	8:05
	cargo	3:53
United	2 eng. pass.	6:38
	4 eng. pass.	9:01
	cargo	4:18
Western	2 eng. pass.	7:37
	4 eng. pass	9:10

** Figures do not include operations of local service route 106 now operated by Braniff Airways as result of Braniff-MCA merger.*

*** Figures are for period from July 1 through August 15. Braniff-MCA merger was effective August 16, 1952.*

Extra Section

By William Perreault

OUR RECENT ITEMS on the subject of safety caused two other definitions of safety to be brought to our attention. One of these was formulated by **Jerome Lederer,** president of the Flight Safety Foundation, commenting on the recent Wright Brothers Lecture:

"To the airline passenger, safety means absence of anxiety.

To the manufacturers, safety often means an interference with the production line or reduced range and payload.

To the vice president in charge of airline public relations, safety is a word that should seldom be mentioned above a whisper.

To the editor of a newspaper, aviation safety is something to be hidden on the last page, along with railroad accidents.

To us in aviation, safety means the public acceptance and support of air transportation."

•

And from Northwest Airlines' Alex Anderson comes a note on NWA's creating a new post of director of ground safety, to be filled by W. E. Bertram. Lack of a specific man with prime responsibility for safety hampers the safety goals of many companies. In announcing Bertram's appointment NWA published an item called "Safety is Your Business," comments of NWA's new president, General Harold R. Harris, which were originally directed to Pan American employees in his previous post:

"Your personal responsibility to the public of the world is permanent, as long as you work in air transportation.

"Your full personal responsibility for your future, for the future of your company and for the future of your industry rests with you.

"You are personally responsible for the most valuable asset in the world—human life.

"There can be no compromise with safety, as there can be no compromise with your own inner conscience.

"The public is the most intolerant and demanding boss you will ever have. But the rewards are deep and permanent for serving this boss with complete dedication. The rewards come in the strengthened sinews of your own character.

"The public will tolerate no laxness, no carelessness, no excuses if you compromise with safety, for even a second. The public demands endless and continuing discipline.

"But the public will reward you for a perfect record by putting its faith in your industry, in your company and in you. As this public faith expands in future years, you will find increased opportunities for your own personal progress in an expanding industry.

"Individuals in management may come and go. But your personal responsibility to the public remains permanent. And it is carried out by actively moving forward in your work, not passively waiting for someone else to perform."

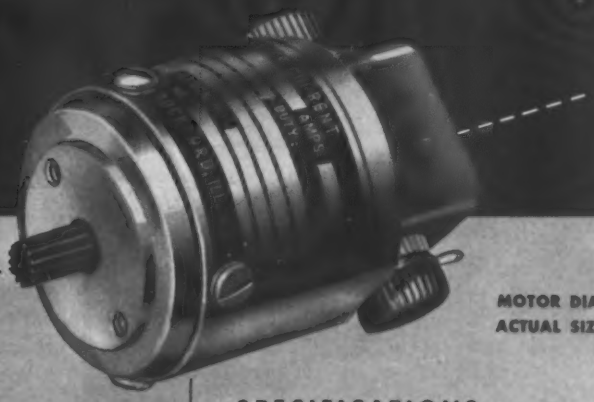
•

Northwest also reports the case of their Stratocruiser that left Tokyo one morning, flew 4,906 miles to Seattle and landed three minutes before the time it took off. It left Tokyo at 9:10 a.m. on Sunday, December 7, crossed the International Date Line, losing 24 hours in the process, landed in Seattle at 9:07 a.m. on Sunday, December 7. Record flight time: 15 hours and 56 minutes.

BARBER COLMAN

PERMANENT-MAGNET MOTORS

NEW...



MOTOR DIAMETER ACTUAL SIZE, 1½"

WITH COMPLETELY

Symmetrical

ARMATURE WINDING*

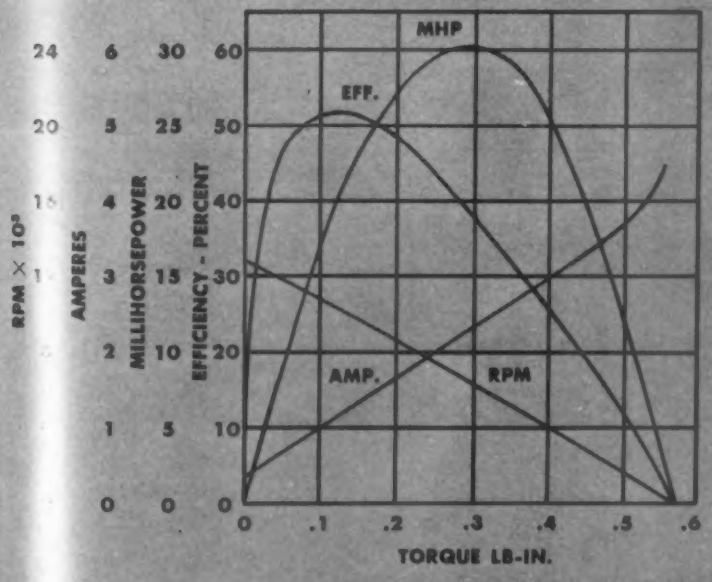
Completely symmetrical armature winding . . . the most outstanding motor development in years.

*Patent Applied for

NEW ARMATURE DESIGN

- True electrical balance.
- 25% higher efficiency.
- Superior commutation.
- Extremely low radio noise interference.

CHARACTERISTICS OF BYLM 40001 MOTOR



SPECIFICATIONS

Specifications of BYLM 40001 motor:

Maximum output	30 millihorsep
Rated output	20 millihorsep
Voltage	26 volt
Current at rated output	1.2 amp
Speed at rated output	10,300
Duty cycle (based on rated output and 200° F. ambient)	3 minutes on, 7 minute
Moment of inertia	8.22 x 10^{-3} lb
Weight	7.25 ou

BARBER-COLMAN PERMANENT-MAGNET MOTO

Withstand Sudden Reversals

Magnet stabilization eliminates demagnetiz effect common to most p-m motors w reversed suddenly at full speed.

Have Powerful Dynamic Braking

Elementary control circuits short armat terminals for dynamic braking. A full s from 10,000 rpm in about 10 revolutio

Tapered Air Gap

For improved commutation — normally av able only in larger motors.

Meet Military Specifications

Radio interference suppression to USAF72 or MIL-I-6181 up to 150mc. available on motors. Suppression to higher frequencies request. Conforms to all performance, envir mental, vibration, and shock requirements AN-M-10a and AN-M-40.

VERSATILE DESIGN

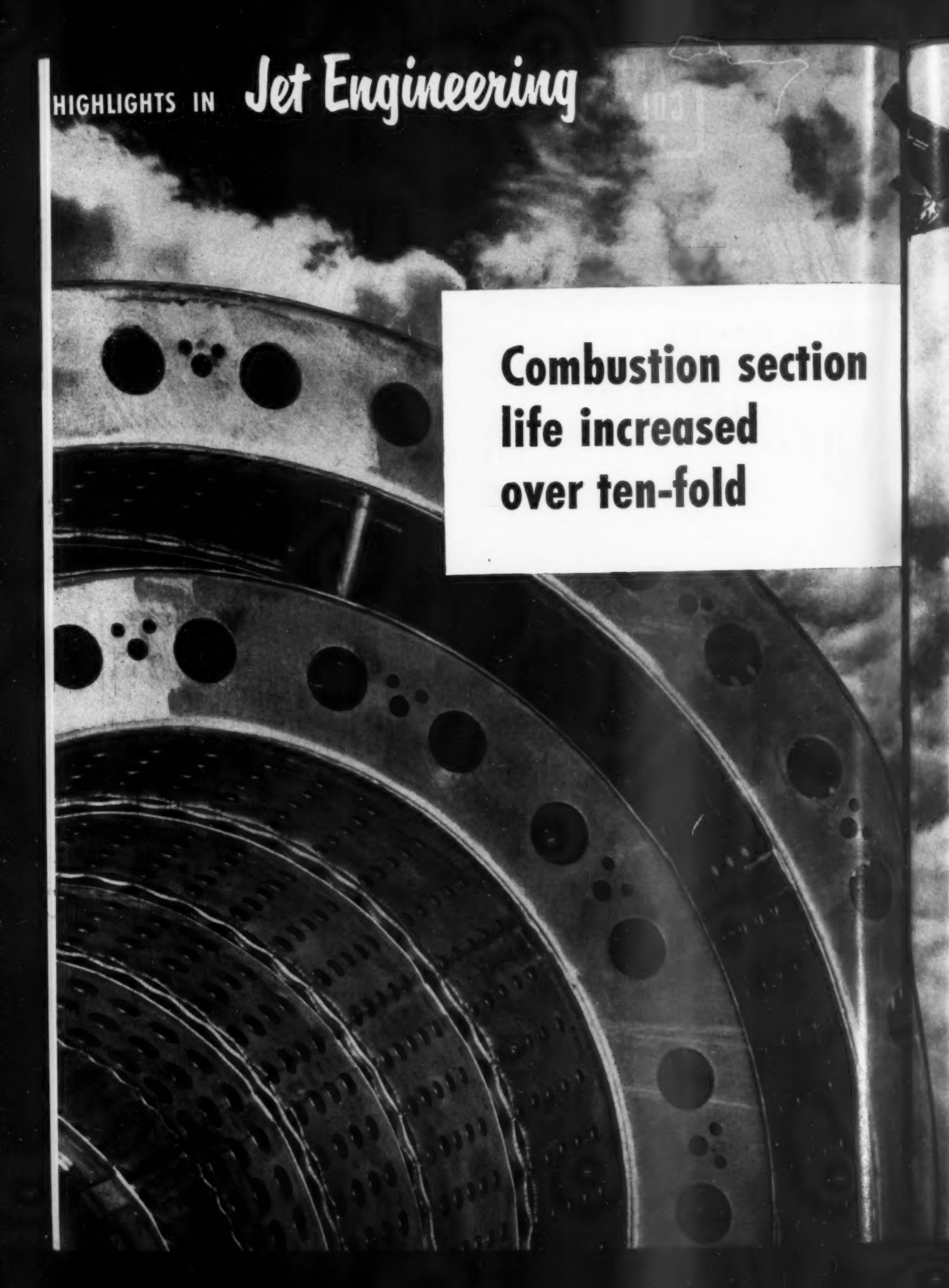
Write for Bulletin F4344 to see versatility of design and adaptations.

Barber-Colman Company

BARBER COLMAN

1263 ROCK STREET • ROCKFORD, ILLINOIS

HIGHLIGHTS IN *Jet Engineering*

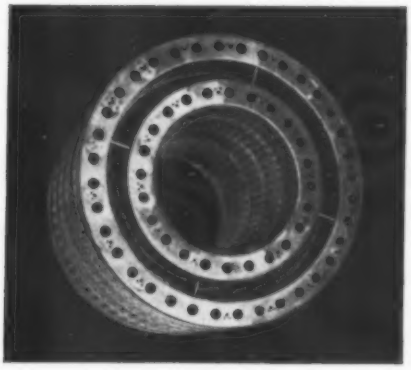


Combustion section life increased over ten-fold

The combustion section of jet engines was given an unprecedented lease on service life with the introduction of the "step wall" liner. The unique design of this combustion chamber liner has proved itself beyond question in the unequaled combat record of the Westinghouse J34 engine. By eliminating severe hot spots and their heavy engine damages, the liner answered one of the most critical of all service-life problems.

The actual design features of the "step wall" liner, a Westinghouse patent, stand out at a glance. In place of the usual cylindrical sheet metal construction, telescopic circular sections have been fitted together. This gives the liner a stepped contour, instead of a flat surface, allowing a continuous blanket of relatively cool air to pass over its surface. The result: protection from the ravages of temperatures over 3000°F.

While the J34 was setting its unparalleled combat records in Korea, Westinghouse engineers were designing another new jet engine, using the "step wall" liner—the J40. Already severe altitude and wind-tunnel tests have been made. Again new records have been set . . . over 700 hours without a major component change. And again Westinghouse engineers have new designs on their drawing boards . . . new plans to keep advancing the jet engineering of today, with an eye to faster, more economical air transportation tomorrow. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-54015

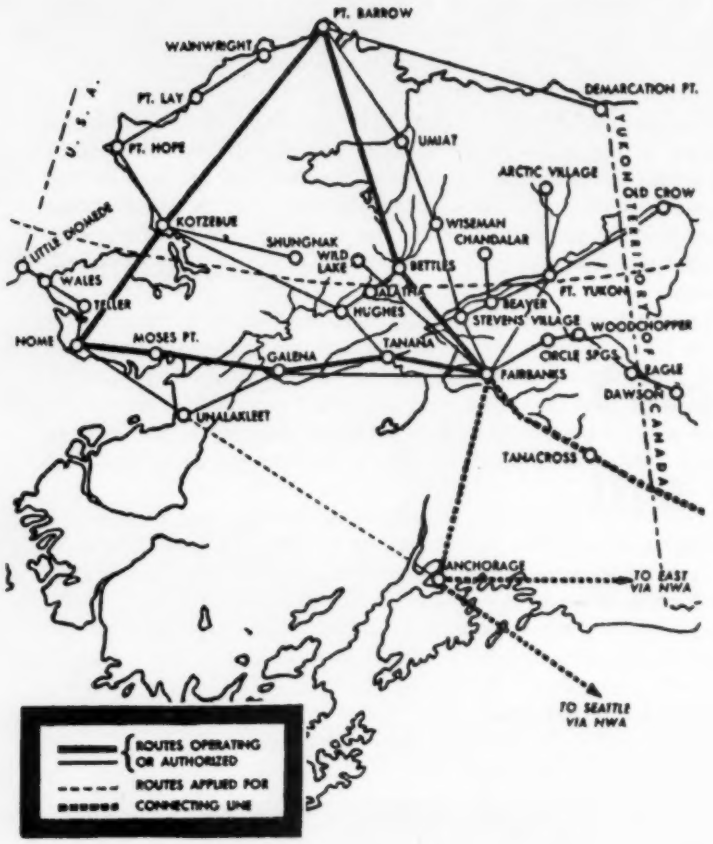


"Step Wall" Liner—Full view of combustion chamber liner shows stepped contour design on both inside and outside sections.

YOU CAN BE SURE...IF IT'S

Westinghouse

Wien Routes Cover Half of Alaska



Wien Alaska Airlines Tops the World

Carrier with northernmost route serves half the Territory, does maintenance work outdoors at 50° below zero.

By Eric Bramley

One of a series of articles based on an extended trip to Alaska.

THE DC-3 WAS FLYING at 10,500 feet, a smooth trip. The stewardess was serving sandwiches, olives, coffee, cake, and Jello, and the pilot informed us that we would reach our destination about 1:30 p.m.

This description could apply to any number of flights, but the route of this one made it different. It was Wien Alaska Airlines' 526-mile DC-3 trip from Fairbanks to Point Barrow, Alaska, said to be the northernmost point in the world served by a scheduled airline.

We were over the Brooks Range of mountains, some of which hasn't been fully explored. Nevertheless, you hardly feel that you're doing anything unusual when you're sitting in a comfortable seat in a well-heated cabin, enjoying lunch—despite the fact that your destination is just a little over 1,000 miles from the North Pole.

The flight was routine. Wien does it once a week, carrying passengers, mail, and cargo in a DC-3, and hauls cargo and mail a couple more times a week with a C-46. The airline, which calls itself the "world's farthest north scheduled airline," has been flying over these wastelands for many years.

Wien's 3,400 miles of main and bush routes cover half of Alaska. However, this 50% of the Territory happens to contain less than 25% of the population. It's a long, unproductive way between stops.

In addition to the sparse population, Wien has had numerous other problems that have made life far from easy. It has been completely without hangar facilities, and has performed maintenance outside in wintertime temperatures that sometimes go to 50° below zero.

In some of its territory there's practically no daylight during the winter. Its aircraft utilization is low. There's no way to get gasoline and other supplies to some outlying stations unless you fly them. Facilities at these stations aren't good. The company has lacked working capital.

Despite these drawbacks, Wien carries upwards of 9,000 passengers yearly, almost 1,000,000 ton-miles of freight and over 150,000 ton-miles of mail. And it's in the process of getting itself "out of the woods" operations-wise, with new hangar facilities and other new equipment.

Credit for the fact that the airline has been able to pull through despite some tough breaks goes in large part to the Wien brothers, Noel, Sigurd, and Fritz. Noel Wien is the dean of the living Alaskan bush pilots. He started flying in the Territory in 1924—and is still flying for the airline.

After the usual bush flying stint, Noel organized Wien Airways of Alaska, which later (1936) merged with Northern Air Transport (formed by a group of Nome businessmen). Noel bought controlling interest and changed the company's name to Wien Alaska Airlines.

Meanwhile, brothers Sig and Fritz had come to Alaska from Minnesota (brother Ralph was killed in an accident at Kotzebue in the 20's) and had learned to fly. Sig was one of the first Alaskan pilots to get an instrument rating, and did considerable flying around Barrow, including oil exploration work for the Navy.

In 1940, no longer wanting the management headaches, Noel sold his controlling interest in the airline to Sig, who is now president and general manager. Fritz is vice president and operations manager. Another key official is George Rayburn, executive vice president, who has been associated with the Wiens for years.

Noel retains a directorship, but is not an officer. He prefers to devote his time to flying his single-engine Cessna for the airline, hauling tourists to points north of the Arctic Circle.

Today, Wien's principal mainline routes are from Fairbanks, its headquarters, to Nome and Kotzebue, from Fairbanks to Point Barrow, and Fairbanks to Ft. Yukon. In between these routes, it operates extensive bush mileage to points all over the northern part

of Alaska, including such remote places as Point Hope, Point Lay, and Wainwright, on the desolate northwest coast.

Its flying equipment consists of three DC-3's, two C-46's six Norsemen, three Cessna 195's, and eight Cessna 170's. Employes number 130, of which 24 are pilots.

Wien performs its own maintenance except major airframe and engine work, which is done by various companies on the west coast of the U. S. Daily DC-3 utilization, on a year-round basis, will be about three hours. Bush equipment will total even less. One reason for this is that the company has had no hangar facilities at Fairbanks International Airport. In winter, a mechanic's efficiency will be about 20% of normal in the sub-zero temperatures, and this complicates maintenance.

Another factor is the necessity for bringing bush equipment all the way to Fairbanks, from such places as Barrow, for major work. These outlying points have no facilities at all. In addition to maintenance, there are frequent periods of bad flying weather, which cut utilization. And as is the case with most Alaskan operators, Wien must have enough equipment for peak summer business—equipment that it can't utilize fully in winter.

However, the company is now constructing a hangar at Fairbanks, which will help the maintenance situation immeasurably. It has been approved for a $355,000 loan under the Defense Production Act, the money to be used for the Fairbanks installation, plus small hangars at Barrow and Kotzebue, and for operating capital.

Another Wien problem has been the one-way haul—the curse of many Alaskan airlines. Out of Fairbanks, loads will be good; coming back, they'll be very light. For this reason, the company is concentrating on the development of tourist business, which insures a two-way haul. In 1951, it handled over 1,000 tourists and exceeded that figure in 1952.

It offers tours out of Fairbanks to Nome and Kotzebue (Alaska's largest Eskimo village, where Wien houses the tourists in its own "hotel"—"facilities may be scanty but the hospitality is boundless"). It also offers Fairbanks-Ft. Yukon, which is attractive to a tourist because it's a short trip, yet is just over the Arctic Circle.

Wien has promoted its tours not only in Alaska, but in the U. S. through travel agents and through some airlines which now carry the Wien tour folder in their literature. It has succeeded in extending the tourist season somewhat beyond the previous July-August period, and may even go into winter tours. Perhaps more than any other airline, Wien is banking on future tourist business for substantial revenues.

WIEN TRUCK at Point Barrow is equipped with DC-3 tires to keep it from sinking into the soft ground.

For the future, Sig Wien sees the need for a new airplane in Alaska—a twin-engine aircraft that will operate from land, water, and snow, carry about 12 passengers, get in and out of short fields, and have a large cargo door. The Wiens have been actively interested in the Honningstad 5-A Finnmark amphibian, which has been developed by Norsk Flyindustri A/S, of Oslo, Norway, and Noel and Sig have both been abroad to see it.

An Eye on the Finnmark

This plane, with a flying boat hull, is equipped with retractable wheel and ski gear. Powered by two P&W 600-hp R-1340 Wasp engines, it carries a crew of two and up to 12 passengers. Seats are removable, so that the entire cabin can be used for cargo. The plane first flew three years ago, and has been undergoing tests and refinement since. The Wiens are keeping an eye on its development.

To get an idea of Wien's operations, I made the trip to Barrow with Capt. Bob Savarria, Co-pilot Cliff Everts, and Stewardess Kay Pedersen (who flew for Northwest Airlines before moving to Alaska with her husband). There were 12 passengers aboard, about half of whom were Eskimos returning to Barrow from visits in Fairbanks. The others had official business in Barrow. Ten of the DC-3's seats were loaded with cargo.

Noel Wien

A little over an hour out of Fairbanks, the plane landed at Bettles, just above the Arctic Circle. This intermediate field was constructed by the Navy and is maintained by CAA. Only structure in sight is the Wien roadhouse, an attractive log building, which can accommodate overnight visitors. Some of Wien's bush routes radiate out of Bettles, and two Cessnas and a pilot are stationed there.

Leaving Bettles, the DC-3 climbed to 10,500 feet, on instruments, to clear the Brooks Range. Then came the low, swampy plain that stretches a couple of hundred miles north to the Arctic Ocean and Barrow. The Barrow landing is made on a steel mat on the shore. This mat is laid on the sandy, gravelly terrain, into which you sink ankle-deep. Trucks frequently get stuck, but Wien solved the problem by putting DC-3 tires on its vehicle (see photo).

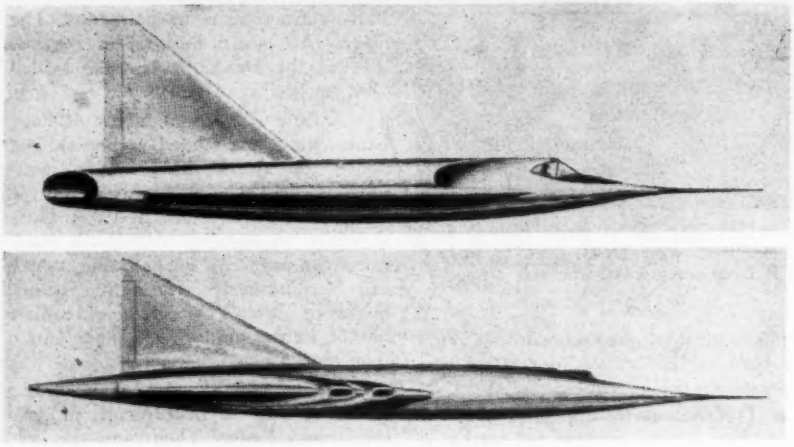
Barrow is a desolate, wind-swept place, consisting of a Navy installation and a native village. About one boat a year gets in with native supplies, and generally it has no room to carry anything for Wien. Therefore the airline flies in its gasoline, and by the time it's set down in Barrow, the cost is over $1 a gallon.

The return flight was made in CAVU weather, and instead of going over the Brooks Range, we went through it, winding up Anaktuvuk Pass between 1,000 and 2,000 feet off the ground. The Barrow-Fairbanks trip took about three and a half hours.

The airline is furnishing a vital service to all these far-north points, which would be completely isolated were it not for the airplane. It moves packages via air parcel post at surface rates, because there's no other way to get them to destination. Thus, although the company is in a high subsidy class as far as mail pay is concerned, it's more a subsidy to the public than to the airline, in the opinion of some officials with whom I discussed Wien's operations.

With new facilities, the airline will be in an even better position to serve its sparse territory than in the past. As far as the future is concerned, Sig Wien believes there may well be need for some mergers in Alaskan aviation, although there's nothing in sight now. "Mergers may work out all right," he says, "but we can never get so large that we lose sight of the needs of the people." • • •

In the Wind at Convair



Things to come: Convair's annual report displays these artist's conceptions of new company designs, with the accent on the delta wing. At top, the XF-102 Air Force interceptor, which has been ordered into production. Below, a supersonic bomber design. Convair is developing such a plane, for which it has hopes of production.

Airlines Already Pay 'User Charges'

Fuel taxes paid to Federal government more than cover airlines' share of costs, ATA asserts.

The Federal tax on aviation gasoline and oil is a user charge, and the scheduled airlines' 1952 payment of almost $12,000,000 was "entirely sufficient" to cover their fair share of the cost of the Federal airways, the Air Transport Association has stated.

This was the first public statement of the industry's position on the controversial subject of user charges. It has been predicted that the question of establishing such charges will receive attention in Congress, although no legislation has yet been introduced. The Commerce Department is currently in the process of studying charges for all types of Federally provided transportation facilities and is expected to make policy recommendations.

The industry position contains a new idea:

• **One-third of the cost** of the Federal airways should be set aside for military standby value, not including any allowance for military traffic currently operating over the system.

It also sets down the reasons why the gas and oil tax is favored as a user charge:

• **It can be increased or decreased** easily to keep payments on parity with the industry's fair share of the costs.

• **No new legislation is required.** The tax is presently in operation and is simple and inexpensive to collect.

• **It treats the various users equitably.**

The fiscal 1952 cost of the Federal airways was estimated by ATA as $67,000,000, including maintenance, operation, overhead, and amortization of the capital investment in airways facilities. It apportioned this cost as follows:

Military standby value	$22,600,000
Military (current traffic)	18,200,000
Scheduled airlines	11,300,000
Other civil users	14,800,000

In calendar 1952, the scheduled airlines paid $11,500,000 in Federal gas tax (2¢ per gallon) and $456,000 in oil tax (6¢ per gallon), ATA estimated, adding that "it is obvious that these amounts adequately cover the allocated share of the airlines."

The "other civil users" would include irregular carriers, fixed base operators, business and industrial fliers, and private fliers. There are no statistics available on how close they came to covering the $14,800,000 which the airlines claim is their fair share, ATA says.

The military standby percentage of 33.3% was arrived at after considering "(a) the volume of traffic generated by the military during World War II (military operations were about 65% of total traffic in 1944) and projecting it to a future full-war emergency; (b) the fact that the military can instantly commandeer the use of all or any part of the airways system in time of such emergency; and (c) the operational priorities the military presently receive."

As to the $44,400,000 cost remaining after deducting military standby, ATA said: "After comparing the airways to other public utilities we have found that elements of rate-making used in the telephone and electric power industries are most applicable to allocating cost responsibilities of airways users.

"It is our judgment that the two-thirds . . . remaining . . . should be allocated among the user groups in proportion to their use of the airways system at times of peak demand, that is, during the days of highest traffic density along the airways and at airports."

There is little question, it added, that the cost of the system will increase as the Common System is completed and new traffic control devices are installed. Whether traffic will increase sufficiently to raise Federal income enough to cover the costs is hard to estimate, the statement said, but it reiterated that the gas tax can be raised or lowered to cover the airlines's share.

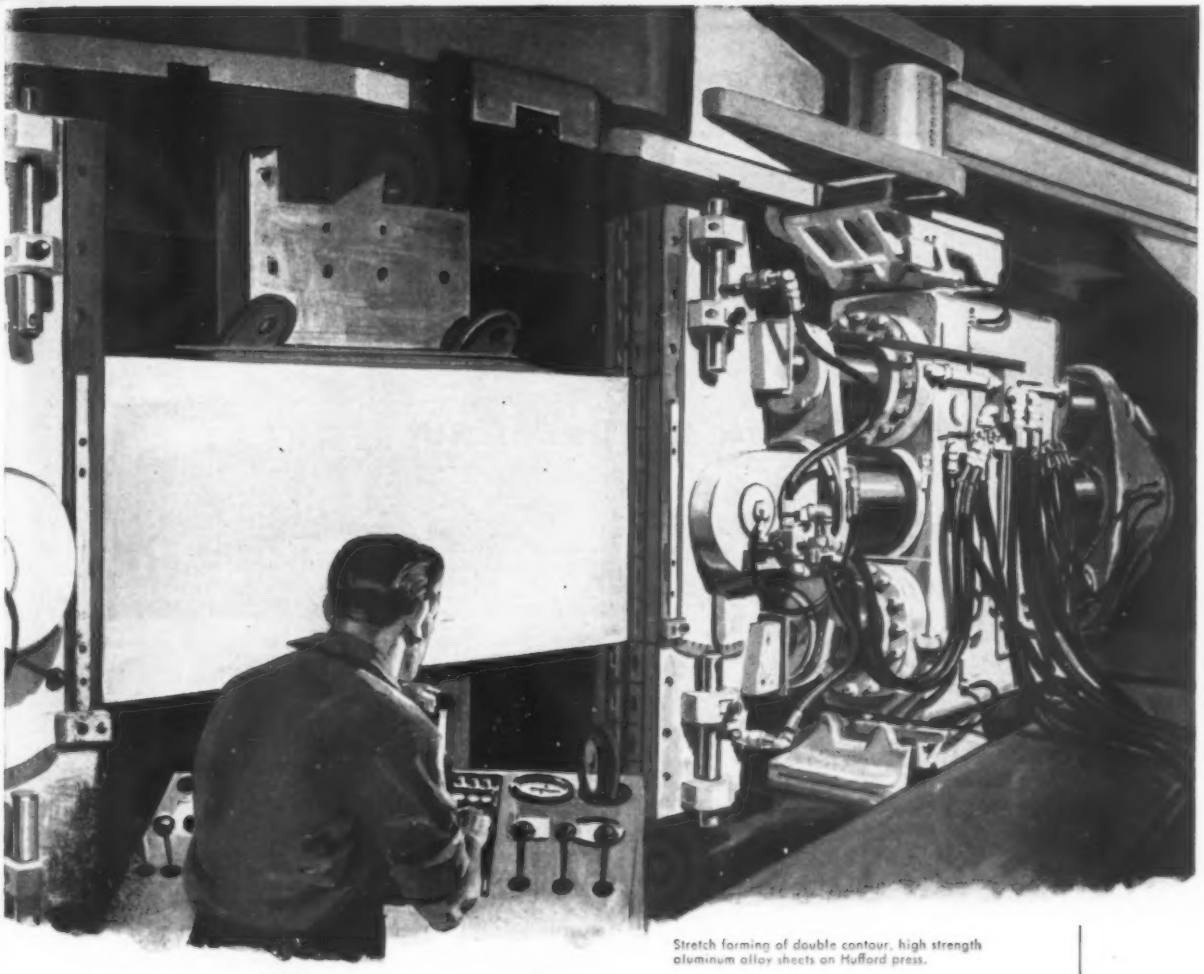
It was also revealed that the ATA board at its last meeting decided that any government studies on user charges should not be directed at airlines alone, but at all transportation; that in such studies, apportionment of costs should reflect military standby charges; that the industry should make efforts to gain public recognition of the fact that airlines pay substantial charges through the gas tax; and that the 1952 amount was sufficient to cover their fair share.

Rapid Tax Write-Offs Benefit Five Carriers

Newest list of rapid tax write-off approvals by the Defense Production Administration gives United Air Lines a $56,768,049 certificate permitting five-year amortization of 25 Douglas DC-7's. Four Delta Air Lines DC-7's, valued at $7,500,000, were also approved, as were seven Lockheed L-749's ($6,763,568) for Capital Airlines.

The Flying Tiger Line won approval to write off seven DC-6A's worth $9,100,00 while Eastern Air Lines obtained a $2,027,993 certificate covering spares on 30 Lockheed Super Constellations and 60 Martin 4-0-4's approved for five-year amortization last year.

A total of 340 aircraft and spares valued at $350,500,000 have now been approved for quick write-off because they add to the nation's air lift capacity.



Stretch forming of double contour, high strength aluminum alloy sheets on Hufford press.

Equipment COUNTS — AT CANADAIR

Finer tolerances . . . more complex forming methods . . . precision machining: these are factors confronting aircraft manufacturers today.

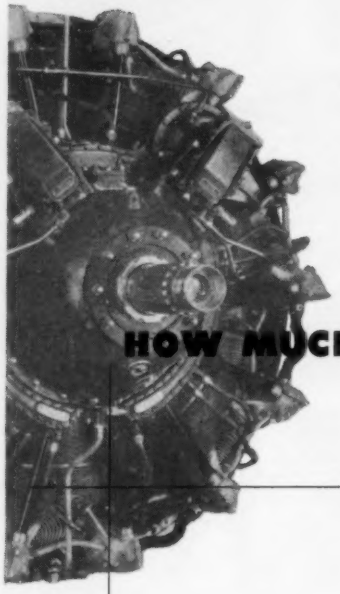
Canadair's advanced equipment . . . efficient production methods . . . and skilled labor force combine to master these challenges.

Count on Canadair . . . where the combination of fine equipment and skilled people puts lasting quality into the planes she builds.

CANADAIR

LIMITED, MONTREAL, CANADA

A subsidiary of
GENERAL DYNAMICS CORPORATION
New York, N.Y. — Washington, D.C.



finally

HOW MUCH DOES AN OVERHAUL COST?

It costs more than just the price charged by the overhaul shops. Delays in engine delivery pile up expensive ground time. Small, not quite right fits and adjustments add mechanics' time and pilot annoyance throughout the service life.

The total of all these things make up your true overhaul cost. An Airwork overhaul eliminates these secondary costs. That is why an Airwork overhaul, whether of engine or engine accessories, saves you money!

Airwork provides factory new performance—every component is rebuilt, tested and inspected to the highest standard of dependability. Production line techniques equal to those of the original manufacturer are used—because that is the only way to get unvarying quality.

A production control board charts actual daily progress of your engine through Airwork. Potential troubles are spotted and eliminated before they can become bottlenecks. That is why you get on-time deliveries of your engines.

The proof of it all lies in the acceptance of Airwork as the prime overhaul base for 6 scheduled airlines—the people who know total overhaul costs best of all.

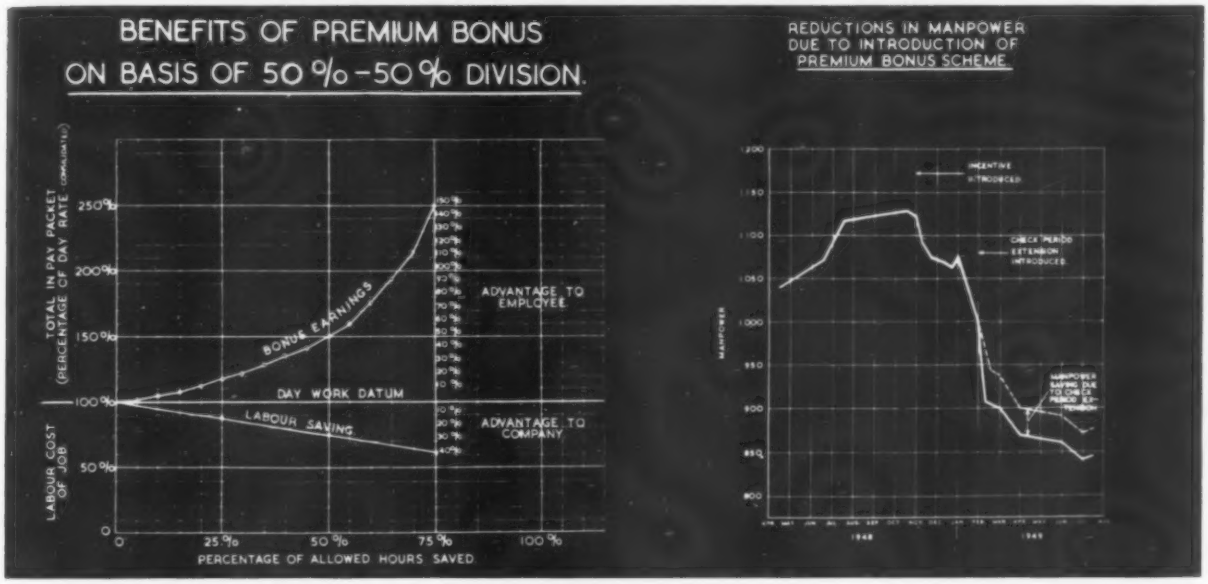
Airwork has 21 Class A Dealers who will be glad to handle your overhaul and supply problems. Ask them about Airwork's Personalized Service, and the Airwork exchange program.

DISTRIBUTORS FOR PRATT & WHITNEY AIRCRAFT — Airwork CORPORATION

Millville, New Jersey

NEW YORK • MIAMI • WASHINGTON

Maintenance Bulletin Board


BENEFITS OF PREMIUM BONUS
ON BASIS OF 50%-50% DIVISION.
TOTAL IN PAY PACKET (PERCENTAGE OF DAY RATE EARNINGS)
LABOUR COST OF JOB
BONUS EARNINGS
DAY WORK DATUM
LABOUR SAVING
ADVANTAGE TO EMPLOYEE
ADVANTAGE TO COMPANY
PERCENTAGE OF ALLOWED HOURS SAVED
REDUCTIONS IN MANPOWER DUE TO INTRODUCTION OF PREMIUM BONUS SCHEME
MANPOWER
INCENTIVE INTRODUCED
CHECK PERIOD EXTENSION INTRODUCED

COMPANY AND EMPLOYE gain under incentive plan, as shown at left, above, with increased pay to employe and decreased labor cost to company. At right, above, first eight months under incentive plan shows sharp drop in manpower at BEA's Northolt base.

Incentive Plan Works in BEA Maintenance

The "payment by results" incentive system introduced by British European Airways in its maintenance and overhaul shops late in 1948 continues to bring BEA results, with these gains recorded since its start:

• **Man-hour requirements** for a specific job have dropped. BEA estimates an overall reduction of 50% when compared with the time taken before the bonus plan was started.

• **Maintenance costs** per flying hour have been cut almost in half. On the Viking airplane approximately 40% reduction in costs was conservatively attributed to the incentive program in its first year of use.

• **Production** has increased while work forces have become smaller. Despite increased workloads to meet an extended flying schedule and the addition of personnel for the fixing of job rates and for timekeeping, BEA's staff at the Northolt base dropped some 25% from 1,125 to 850 employes.

• **Take-home pay** for the worker has increased 37%. For each eight dollars the average skilled BEA mechanic earns as basic wage, he is realizing a bonus of an additional three dollars.

The incentive plan used at BEA is commonly referred to as the "individual" type, as distinguished from those that base the incentive payment on the performance of groups of workers. At BEA the worker is paid 50% of the dollar value of the time he saves on a particular job, using this formula:

$$\text{Wage} = \text{Time Taken} \times \text{Basic Rate} \text{ plus } \frac{\text{Time Saved} \times \text{Basic Rate}}{2}$$

Spelling out the advantages of this system over other types, Hugh Gordon, BEA chief maintenance engineer, pointed out these three in a recent discussion before a Society of Automotive Engineers session in Detroit:

• **It offers a strong incentive** for the conscientious mechanic.

• **It is easily understood** by the mechanic.

• **It encourages** the maximum output per man-hour.

Weakness of the individual incentive system, conceded by Gordon, is the variation in earnings it can produce between mechanics, the lack of support that it offers to team spirit, and the complexity it presents in calculating wages.

But at BEA the system has worked both to the benefit of the company and the workers (see charts). On the horizon is a new challenge—BEA is introducing twin-engine Airspeed Ambassadors and four-engine turboprop Vickers Viscounts. The success of the incentive scheme in meeting the new equipment problems is a matter only the future will decide—but if its past performance is a yardstick, the "payment by results" plan will continue to produce good results.

Color Blindness Tests

Flight Safety Foundation reports a recent survey conducted by an oil company brought out the fact that airport fuel dispensing personnel are not tested for color blindness. Since color is used to identify the octane rating of fuel, FSF urges that the condition be corrected.

JP-4 Fuel Changes

Proposed changes in JP-4 jet fuel were discussed at a recent meeting of the Petroleum Administration for Defense military fuels technical advisory committee. Talks concerned possibility of improving quality of fuel without substantially reducing availability. Subject was last discussed in committee meeting in August, 1952, with recommendation for no change at that time.

Need a "double"?

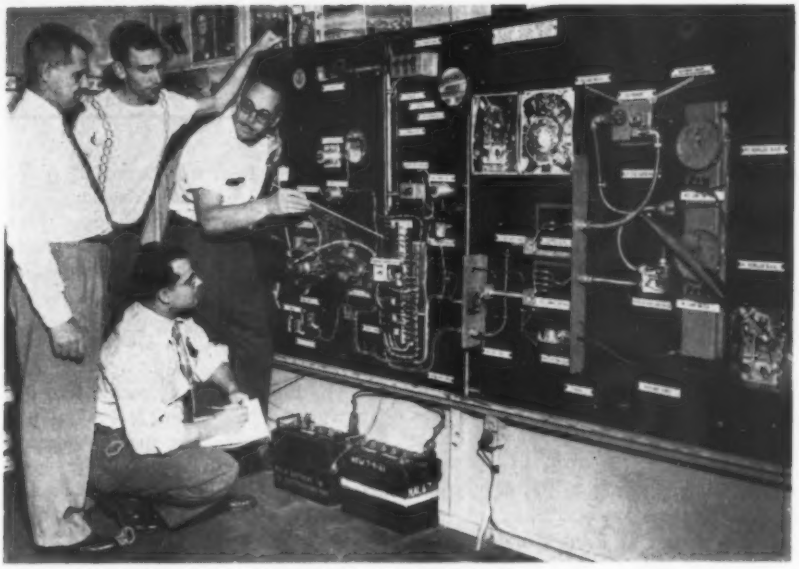
In so many organizations the top men, the key men, need "doubles" — that's one of the big reasons for so many company-owned Beechcrafts. These swift carriers whisk needed men to *where* they're needed in hour-saving, day-saving time. The faraway problem is reached and solved, and you're back before you're missed.

Travel-time is cut as much as 75 per cent with Beechcrafts. You go when you need to; you're on the job; you "get the true picture" firsthand—quickly and economically. In fact, typical costs and operating data may change your whole conception of the cost of Beechcraft travel.

☆ ☆ ☆

Call your Beechcraft distributor or write Beech Aircraft Corporation, Wichita, Kansas, U.S.A.

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS



CONTRIBUTING TO DESIGN of NAL propeller circuit mock-up were (left to right) engineers H. Archer and C. Clark, electrical group leader W. Berry, and maintenance training director R. Phillips.

Mock-up Briefs Crews On New Prop System

An operating mock-up of the Hamilton Standard 43E60 propeller control system on National Airlines Douglas DC-6 and DC-6B airplanes is serving two purposes for the company: illustrating the more recent safety features added to the system, and providing a permanent training medium that will permit the instructor to reproduce propeller malfunctions.

The several additional safety features of the system—two wire solenoid valves, separate solenoid conduits, jacketed shielded wire, first throttle lock light, etc., are shown on the mock-up in the same manner as they are installed in the airplane.

The idea originated with NAL's assistant chief engineer H. C. Archer and was built by engineers W. H. Berry and C. E. Clark and maintenance training instructor R. Phillips. It has been used to instruct National's pilots, mechanics, and flight engineers at New York and Miami and will be demonstrated to maintenance personnel at all NAL's line stations.

ire Reveals Hazard n Sump Pump Plug

Minor repairs with major repercussions: a good case for safety engineering. One airline reports that while making minor repairs to a fuel truck plumbing system a quantity of gasoline was spilled into the automotive shop grease pit. A mechanic promptly pulled the sump pump plug from the nearby wall receptacle to avoid the possibility of sparks from the pump motor igniting the gasoline vapors.

After the truck was removed and the pit flushed with water, another mechanic partially reinserted the plug in the receptacle and the resulting sparks ignited the remaining fuel vapors. Hand extinguishers brought the fire under control, but only after two men were burned about the hands, legs, and face.

The cause? The sump pump motor was explosion proof, but the receptacle and plug were not.

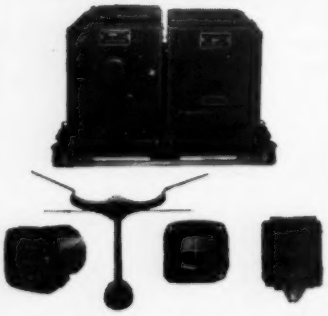
Rubber-Backed Rug Cuts Noise, Vibration

Goodrich Flight Rugs are being installed by Chicago & Southern Airlines in Lockheed Constellations both in the forward compartment and in the main cabin under-seat areas. The rugs are of Avtrim material with a closed cell sponge rubber backing ¼" thick.

The closed cell construction of the material, according to C&S, makes it ideal for use as a floor carpet backing because its outer surfaces are sealed to prevent absorption of dust, dirt, and spilled liquids, adding to both comfort and sanitation. Aside from its smart appearance and the easier maintenance that it offers, the airline expects the new rug to improve passenger comfort, indicating that its construction tends to reduce noise and transmission of vibration.

KNOW
where you are!
with OMNI!

Aircraft Radio Corporation
VHF
Navigation Equipment



Safe, drift-free, static-free OMNI gives you a reliable signal to follow, whatever your bearing. And ARC's compact Type 15D VHF Navigation Equipment makes OMNI available to executive aircraft of any size, as well as to private and transport aircraft. Just tune in OMNI and keep the needle of your ARC indicator on zero!

In addition to OMNI navigation, the 15D provides for use of the visual-aural ranges and amplitude runway localizers. Add an ARC Type 17 VHF 2-Way Communications System and you have independent, static-free voice communication.

Whatever your needs in navigation and communication, there is ARC equipment to meet them. Write today for all the details.

ARC

All ARC Airborne equipment is Type Certificated by CAA. It is designed for reliability and performance, not to meet a price. Installations for both single and multi-engine planes are made only by authorized service agencies.

Aircraft Radio Corporation
BOONTON, NEW JERSEY
Dependable Electronic Equipment
Since 1928

West Coast Talk

Progress at Northrop

West coasters are predicting interesting developments at Northrop Aircraft since Dr. William Ballhaus followed Edgar Schmued to the Hawthorne company. They add up planes like the F-51, B-45, and F-86 (Schmued) and the AD, F4D, and D-558-2 Skyrocket (Ballhaus) and don't need an analog computer to figure out that here is an engineering design team that should come up with a slick new article, but quick.

Dr. Ballhaus came to Northrop from Convair, where he was chief of preliminary design at Fort Worth and in charge of Convair's Model 10 logistic transport project. Before that he was one of Ed Heinemann's stars at Douglas El Segundo and got in on the start of the highly-touted A3D before he left.

He's highly regarded, just as is Schmued for his long record at North American. When Northrop named Schmued v.p.-engineering it consolidated its aircraft and guided missile engineering sections under him.

AiResearch Cools 'Em Off

AiResearch Manufacturing Co. is at work on the development of temperature control equipment for ventilated flying suits. Seems pilots sweat so in this new-style flying toggery that on occasion a pilot coming in from a flight will climb out of an airplane with water up to his knees.

AiResearch's prototype is undergoing tests now on Republic's suit with the refrigeration turbine installed in the airplane. What AiResearch is out to develop, however, is a neat, pocket-size icebox to fit into the suit itself.

Floating a Fortune

After more than five years, it looks as though Howard Hughes might not have to wait much longer to relaunch his eight-engine flying boat in Los Angeles Harbor.

His latest RFC extension is to July 1. The date, however, has little significance because RFC extensions have come to be formalities, approved automatically.

Cabinet work on the laminated wood structure is all completed. All that remains to be done now is to put the engines in shape and await Skipper Hughes' choice of a date.

Hughes got a new set of P & W R-4360's from the Navy not long ago, but decided it would be a good idea to have the cylinders re-worked. He is now having this chore performed—at his own expense, incidentally—at Pacific Airmotive Corp., which also is fixing up some of the nose cases which needed attention.

The big boat's last venture into the bay was on November 2, 1947. Since that time Hughes has spent a fortune on the plane. No figures have been given out recently, but two years ago the Hughes Tool Co. issued a statement saying Hughes at that time had spent more than $17,000,000 of his own money on the flying boat project and was continuing to spend $300,000 each month preparing the ship for additional testing.

Hughes, no doubt, has found a way to whittle out an economy or two since. But $300,000 a month would tack another $7,000,000 or more to the total Hughes bill.

WESTERN MISCELLANY

Lockheed's F-104 has been cancelled out, but the Burbank manufacturer may catch on with a stripped-down fighter. Northrop and North American also are trying to look optimistic about stripped-down designs. . . . Mockup board on **Douglas Long Beach's C-124B** (turboprop) is due in March. . . . When the California Aeronautics Commission set up its ad hoc advisory committee with representation from various segments of the industry it overlooked the **Aircraft Industries Association** until it began to talk aviation fuel tax. Then it discovered the oversight and hastened to invite Capt. L. D. Webb, chief of the AIA's west coast office to become a member of said committee . . . . Lockheed bought 20 **portable plane shelters** and also erected eight pre-fab hangars at its B-9 location (flight test) at Van Nuys to protect workers from the California dew. . . . **Gage Mace, Jr.,** whose father is American Airline's western operations manager, is a test pilot for Hughes Aircraft Co. . . . Pacific Airmotive Corp. is stepping up its **parts stock on R-985 engines** at Burbank to keep parts for 50 engines on hand at all times.

. . . Fred S. Hunter

Western proudly announces its new direct route!

ONE-STOP DC-6B's between MINNEAPOLIS-ST. PAUL and LOS ANGELES

Minneapolis-St. Paul

Salt Lake City

Fastest, most luxurious flights ever offered!

Here's the long-needed *direct* skyway between the great metropolitan centers of Minneapolis-St. Paul and Los Angeles. No more roundabout routes... no more worry about changing planes and making connections. Now you can fly Western's new DC-6B's from Minneapolis-St. Paul to Salt Lake City in only 4 hours, 10 minutes *nonstop*...to Los Angeles in only 7 hours, 20 minutes *one-stop!*

Los Angeles

WESTERN'S DC-6B is the most advanced version of the world-famous Douglas airliners. One of the major new features your passengers will like is the super-pressurized cabin—most comfortable ever developed.

WESTERN AIR LINES

AMERICA'S OLDEST
FLIES AMERICA'S NEWEST

Do you know this panel of experts?

These Avien gages tell a story that may shape your future—especially if you're an engineer.

Remember the days of "ball and needle" instruments?

The men in today's cockpits need far more accurate gages of fuel and other quantities. Instrumentation has become a new science – a science in which Avien is a vital part.

Every month, Avien produces over 10,000 major instrument components for the aviation industry.

We'd like you to meet some of our panel members:

A–Jet Tailpipe Thermometer, first to use the servo principle. Result: long scale and a gage unaffected by lead characteristics.

B–Cylinder Head Temperature Indicator. Again, first to use the servo principle for long scale and greater accuracy.

C–Jet Engine Thrustmeter that computes gross thrust from measurements of tailpipe pressures and ambient pressures.

D–One of more than fifty Avien fuel gages. It measures fuel quantity by weight, eliminates moving parts in fuel tank.

E–Avien fuel gage with a "sensitive" or vernier indicator to provide readability to 0.1% of contents.

F–Counter Indicator, also readable to 0.1% of tank fuel. You can see how it tells the fuel story at a glance.

Avien has made these gages smaller, simpler, lighter, more reliable, more accurate.

Sound engineering made them that way. Hard work and hard thinking made them that way. Individual responsibility – all the way from drawing board to control board – made them that way.

Avien is an engineering operation. Engineers are the "works" here, not the gears. And we're welcoming new members, engineers who can work head-to-head with some of the hardest-hitting men in this business.

If you are an engineer of allied experience, we offer: 1–High pay. 2–Interesting assignments, and the chance to follow through on every good idea you produce. 3–More money and more work, as you earn it.

Modern plants? Of course. Employee benefits? All of them. But most important, Avien offers work! Important, rewarding, fascinating – and *not easy*.

If this makes sense to you, send us a detailed resume before the day is over.

Avien

AVIATION ENGINEERING CORPORATION

34-56 58th STREET, WOODSIDE, L. I., NEW YORK

Ready for Hanging

One of a series of selected portraits of some very select members of the airline family, as seen by the eye of Richard E. Chamberlain.

M-H Fuel Measurement Systems Ordered

Fuel measurement systems manufactured by Minneapolis-Honeywell Regulator Company have been ordered by five airlines, American, National, Delta, United, and Pan American, for Douglas DC-7 or DC-6B aircraft now on order.

A commercial version of the capacitance type system used in more than 40 types of military aircraft, the equipment represents a quarter-million dollar investment. All orders, except that of Pan American, are for DC-7 installation.

CAA Approves DC-3 Rudder Trim Tab

A geared rudder trim tab for the Douglas DC-3, designed to increase the safety and operating efficiency of the airplane by permitting use of higher take-off horsepower, has been approved by CAA.

Granted to AiResearch Aviation Service Co., Los Angeles, holder of exclusive rights on its engineering and commercial installation, the approval precedes similar action expected on a geared aileron trim tab now undergoing CAA flight tests.

With the geared rudder tab installed, according to AiResearch, Pratt & Whitney R-1830-75 and -94 engines using 1,350 take-off horsepower are usable, compared with 1,200 hp now permitted. Rudder pedal forces are said to be reduced by 50% and rudder travel is limited to 20° of operation, preventing it from reaching the stall zone and permitting full and maximum control of the airplane at all times, including take-off.

New Gross Weights For Sod Runways

New performance limitations in Part 42 supplement for use in determining the allowable gross weights of aircraft for take-off and landing on sod runway surfaces have been adopted by the Civil Aeronautics Administration.

The revised rules will apply an approximate 17.6% increase over take-off distances required for paved surfaces and 15% increase for landing distances. The new regulation became effective January 31, 1953.

Based on experiments conducted by the National Advisory Commitee for Aeronautics and the U. S. Air Force, the CAA-adopted rules include take-off and landing weight tables for Douglas DC-3, Lockheed 18, Curtiss C-46, Convair model 28, Douglas RB-18, and Boeing 307 aircraft.

Rohr Tilting Arcs

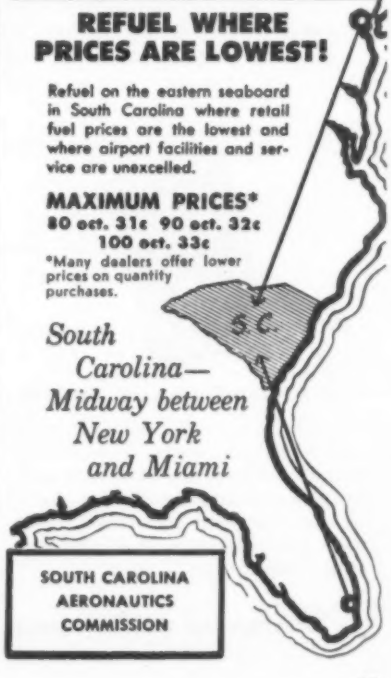
Rohr Tilting Arcs used to facilitate handling of engines, engine assemblies, and complete nacelles will be manufactured and sold by the Pacific Airmotive Corp. under agreement recently reached with Rohr Aircraft Corp.

7¢ FUEL TAX NOW EXEMPTED in South Carolina

REFUEL WHERE PRICES ARE LOWEST!

Refuel on the eastern seaboard in South Carolina where retail fuel prices are the lowest and where airport facilities and service are unexcelled.

MAXIMUM PRICES*
80 oct. 31¢ 90 oct. 32¢
100 oct. 33¢
*Many dealers offer lower prices on quantity purchases.



South Carolina— Midway between New York and Miami

SOUTH CAROLINA AERONAUTICS COMMISSION

Chief Pilot Owen at the controls of the Lockheed Lodestar owned by the Smith-Douglass Company, leading makers of commercial fertilizers. The firm also has a Beechcraft B-35.

Ask the men with the most experience . . .

ask **Clarence B. Owen, Jr.**

Chief Pilot, Smith-Douglass Co., Inc., Norfolk, Va.

"With nine factories—scattered from Virginia and North Carolina to Louisiana, and up into Illinois—our company keeps its two planes mighty busy," says Mr. Owen, a pilot who's logged 6,500 hours in the last 14 years. "And *everywhere* we fly, we know we can count on Gulf for the same fine quality products and the same fine service. That consistent excellence is one of the big reasons why our company, for the last six years, has made it a point to 'Go Gulf.'"

Gulf Aircraft Engine Oil, Series-R

For radial engines, or where a detergent oil is not desired. Approved by Pratt & Whitney and other radial engine manufacturers for all types of service. Retards sludge and carbon formation and retains its body at high operating temperatures.

Gulfpride Aviation Oil, Series-D

For horizontally opposed and Ranger in-line engines. Minimizes ring- and valve-sticking, oil consumption, oil-screen clogging and plug fouling. Users of this great oil have actually increased periods between engine overhauls as much as 100%.

Gulf Aviation Gasoline

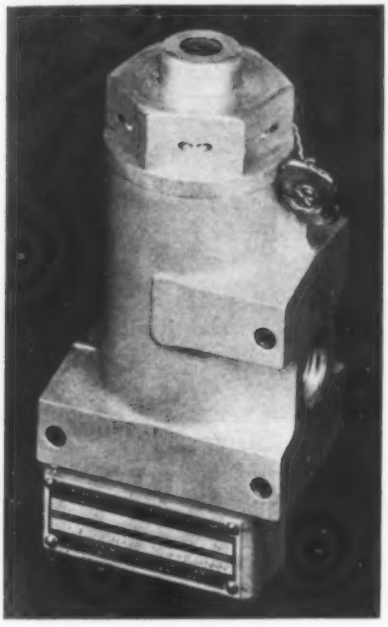
Always "refinery-clean," because Gulf Aviation Gasoline dispensing equipment is equipped with advanced Micronic Filters.

To step up performance, and cut operating costs . . . GO GULF!

Gulf Oil Corporation • Gulf Refining Company

GULF
AVIATION PRODUCTS

New Products

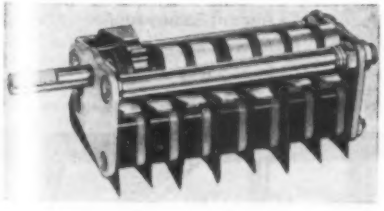


Relief Valve

A cartridge-type hydraulic pressure relief valve, said to be insensitive to back pressure or system pressure, has been announced by the Pantex Mfg. Co.

Used in the wing flap system of Martin 4-0-4 aircraft, the new valve maintains a constant inlet pressure in the flap down line, regardless of pressure and flow conditions in the remainder of the hydraulic system. With its use the flap system can be positioned automatically during take-off and approach, according to a predetermined schedule, and flight officers are relieved of the work of manually controlling flaps at a time when their attention is required elsewhere.

Address: **Pantex Manufacturing Company, Hydraulics Division, Pawtucket, R. I.**



Rotary Switches

Multiple rotary switch assemblies designed for aircraft installations, such as cockpit lighting control, have been introduced by Micro Division, Minneapolis-Honeywell Regulator Company. One of a series, the type 7AS71 shown is a ganged assembly of seven basic type V3 switches with a single-pole, double-throw contact arrangement. It measures 1½" x 1⅝" x 4¾".

Rating of the 7AS71 switch (d-c) for inductive and heater load is 30 volts-10 amps at sea level; 30 volts-six amps at 50,000 feet altitude. A-c ratings are 125 or 250 volts-10 amps. Variations of the 7AS71 assembly range from three- to eight-gang assemblies using the basic V3 switch, and from two to eight switching positions at 45° angular rotation between positions.

Address: **Micro Division, Minneapolis-Honeywell Regulator Co., Freeport, Ill.**

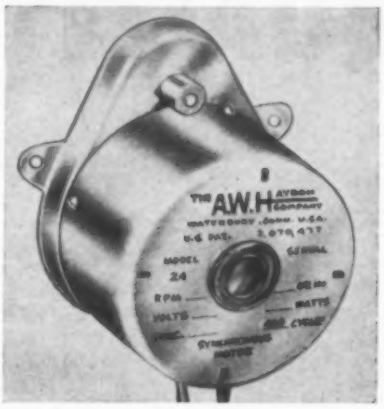
Solenoid Contactors

Solenoid contactors meeting all the requirements for hermetic sealing at ratings of 50, 100, 200, and 250 amps (28-volt, d-c) have been placed in production by the Guardian Electric Manufacturing Company.

Units are constructed in accordance with specification MIL-R-6106, are available for ambients up to 120°, and have been shock tested at 50 g's or more. Design of the Guardian contactors is said to permit complete assembly, adjustment, and testing before sealing. Units are of a type normally grounded, but are available insulated from ground with an increase in height of ⅛" and a slight increase in cost, according to the manufacturer.

Other features of the solenoid contactors include interchangeability with Guardian 10- and 25-amp units, as well as with AN3350 and AN3370 contactors and rugged design, which is said to permit use of improperly set torque wrenches up to 30% in excess, without damage to the relay or seal. Contactors are wired from the top, avoiding difficulties due to inaccessibility during installation.

Address: **Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago 12, Ill.**



Timing Motor

A timing motor weighing 8 ounces and designed for use in 400-cycle alternating current systems has been announced by the A. W. Haydon Co.

Meeting temperature, altitude, and vibration requirements of spec MIL-E-5272, the new motor is adaptable to all A. W. Haydon Co. time delay relays, repeat cycle timers, and elapse time indicators.

Two features of the new unit are almost instantaneous starting and stopping and a single-pole, double-throw switch which provides reversing. It operates on 115-volt, 400-cycle power and torque is .025 oz.-in. at 3,000 rpm starting and running. Power input is 6 watts including the phase shift network. Rotor speed is 3,000 rpm with output speeds available from 3,000 rpm to 1 2/3 rpm.

Address: **A. W. Haydon Co., Waterbury, Conn.**

Pocket Slide Rule

A pocket-size slide rule for the personal aircraft pilot has been introduced by the Tru-Flite Calculator Company. Features of the new calculator are one-hand operation permitting conversion of temperatures from centigrade to Fahrenheit, statute to nautical miles, indicated to true airspeed, and airspeed to ground speed. Edges of the rule can be used to scale statute and nautical miles on sectional and world aeronautical charts.

Address: **Tru-Flite Calculator Co., through General Aircraft Supply Corp., City Airport, Detroit 13, Mich.**

These B-47s Require QUALITY WORKMANSHIP

QUALITY CRAFTSMEN WANTED

Experience . . . . the foundation for QUALITY

Behind the expert hands that guide the tools and processes at Grand Central, lies management experience...experience that has built quality into each and every task... experience that assures leadership, the finest achievement, and the best by test performance, in the field of aircraft modification, overhaul and engineering.

For more than a quarter of a century, Grand Central Aircraft Co. has offered superior workmanship and a finished product based on PRECISION, PRECAUTION, SAFETY and INTEGRITY. Grand Central has grown up with Aviation, on merit alone, into one of the world's finest aircraft companies.

★★★★★★

There is a better job for you with a real future, in the healthful SUN COUNTRY climate of ARIZONA

Qualified Aircraft Men of integrity, with sound skills in aircraft construction are invited to write for information regarding positions in our long range B-47 program at Tucson, Arizona. If you are a good operator, with experience and like the "Pulling Together" spirit, write us today. We need Electronic Technicians, Aircraft Electricians and Aircraft Radio Mechanics. Full employee benefits, high wage scales and excellent opportunities.

MAIL COUPON TODAY

Personnel Manager,
Grand Central Aircraft Co.,
P.O. Box 5072, Tucson, Arizona

name _____

address _____

city and state _____

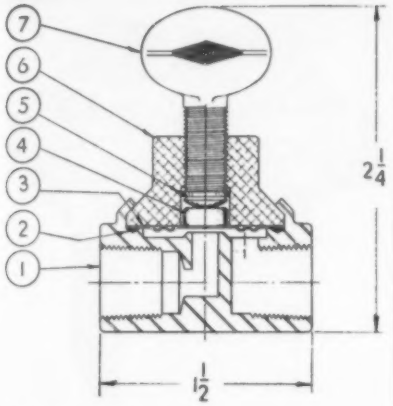
I am qualified in the category checked below, and wish further information.

- ☐ Engineer
- ☐ Drafting
- ☐ Aircraft Electrician
- ☐ Sheet Metal Mechanic
- ☐ Sheet Metal Layout Man
- ☐ Aircraft Radio Installer
- ☐ Aircraft Radio Mechanic
- ☐ Inspector

GRAND CENTRAL AIRCRAFT CO.

GLENDALE, CALIFORNIA • • • TUCSON, ARIZONA

Grand Central Airport — **Municipal Airport**



Globe Valve

A globe valve for hydraulic, pneumatic, or vacuum systems with pressures up to 1,500 psi is of the packless, tamper-proof type and is manufactured by the George W. Dahl Co., Inc.

Obtainable in brass, anodized aluminum, steel, stainless steel, monel, and nickel, the "DEMI-G" valve, as it is called, uses a diaphragm type of seal. In operation (see sketch), diaphragm (3) is sealed in place between bonnet (6) and gasket (2). Actuator (7) thrusts button (4) against diaphragm (3) sealing the inlet port.

Address: George W. Dahl Co., Inc., Bristol, R. I.

Switching Tube

A gas switching tube for airborne radar has been announced by the General Electric Company. Differing from other tubes of this type in its steel reservoir construction, the type GL-1B24-A tube is an integral-cavity, tunable type for use in simple duplexers in pulsed microwave circuits which do not require that the short circuit in the tube have a fixed electrical position.

Weighing ¼ of a pound, the new G-E tube is usable in an operation band of 8,500 to 9,600 megacycles and operates to decouple the receiver from a common transmitting and receiving antenna during a transmission period.

Recovery time is four microseconds at 10 kilowatts peak, three decibels down. It has a leakage power of 30 milliwatts. Transmitter peak power is 100 kilowatts.

Address: General Electric Company, 1 River Road, Schenectady 5, N. Y.

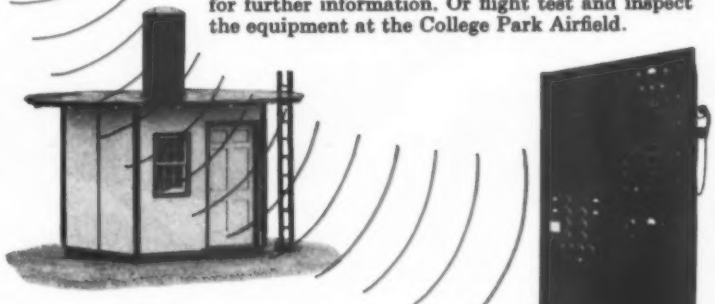
No matter how marginal the weather, planes land safely on fields equipped with TVOR. This new let-down facility keeps your airport operating through rain, low ceilings and restrictions to visibility—extends its usefulness by 40%. TVOR provides all the security of VOR—*at less than one-fourth the cost.*

TVOR was developed to meet the needs of small and medium-sized airports. Its single installation provides a terminal omnidirectional radio range that can be installed in an inexpensive shelter directly on the airport.

Any plane with standard VOR instrumentation can make *positive approaches* to a TVOR equipped field. On course indication is steady. Over the station cone is definite. Fifty watts of antenna power provides ample coverage for omnirange navigation. TVOR is built by the Maryland Electronic Manufacturing Corporation, producers of similar installations for the CAA.

The cost of a complete TVOR installation is less than a quarter that of VOR. Yet the components are of the same high quality and the system is given the same rugged tests!

Corporation, municipal and private airfields can't afford to be without the safety and convenience of this all-weather let-down facility. Installations are ready for 90 day delivery. Write or call today for further information. Or flight test and inspect the equipment at the College Park Airfield.

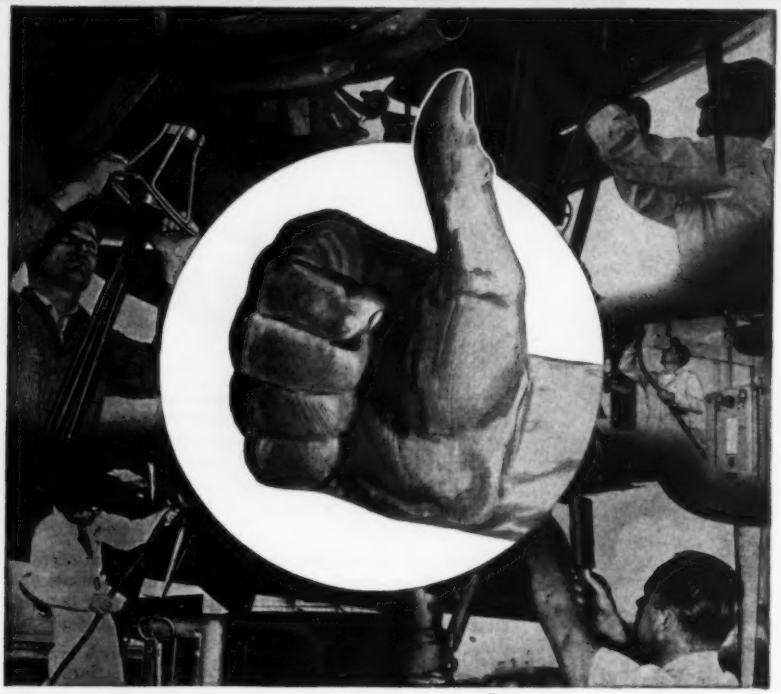


TVOR changes fair-weather to all weather airline service.

TVOR guides corporation aircraft safely to their home fields, in spite of low ceilings.

TVOR works with standard instrumentation. Private planes "home" on their own airfield.

MARYLAND ELECTRONIC MANUFACTURING CORPORATION
COLLEGE PARK 26, MARYLAND



Thumbs-up performance

WHEN YOU FLY **. . . the odds are heavy that JOY electrical connectors will play an important part in starting you safely on your journey!**
Ever since airplanes grew large enough to need auxiliary electrical ground power JOY'S electrical plugs and receptacles have been aviation's preferred choice for connecting portable power leads on motor starters, battery chargers, conveyer loaders and all other types of *on ground* equipment. Factory molded of specially compounded synthetic rubber into resilient one-piece units, they're shatter-proof, watertight and amazingly resistant to rough treatment or the aging effects of sunlight and rapid temperature changes.
Why be satisfied with less . . . when the best actually costs less in the long run? Take a tip from the *thumbs-up* salute of America's line maintenance mechanics. Ask for full information on JOY'S extensive line of aviation connectors today. You'll be glad you did.

RECEPTACLE AN-2552-3A | PLUG AN-2551 | RECEPTACLE AN-2552-A3A

☆ *Extremely Flexible Cable-Connector Assemblies*
☆ *Available with Glass Melamine Receptacle Bases*
☆ *Special Connectors Available for Sub-Zero Use*

Consult a Joy Engineer . . . ASK FOR A FREE COPY OF BULLETIN AV112

MORE THAN 100 YEARS ENGINEERING LEADERSHIP
M. E. 153.1

JOY MANUFACTURING COMPANY
HENRY W. OLIVER BUILDING, PITTSBURGH 22, PENNSYLVANIA
IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LTD., GALT, ONTARIO

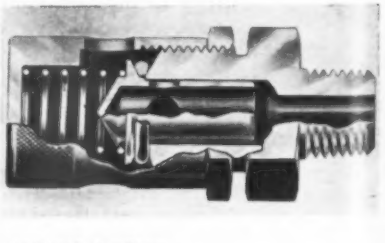
Tool Grinder

A precision tool grinder designed for sharpening all sizes of boring, turning, and facing tools up to ⅝" square has been announced by the Ex-Cell-O Corporation.

Using six-inch cup type wheels, the model 44A, as it is called, sharpens any of the modern tool materials, such as sintered carbides, cast alloys, and high-speed steels. A double-end model, the new grinder includes a heavy steel base, large tool rest, table-tilt provisions for any angle desired and collant tank located in base with large cleanout and drain opening positioned for easy maintenance.

Wheel spindle is driven by balanced inbuilt motor, and shaft is carried by combined radial and thrust bearings. Reversible motor permits left- and right-hand tools on same wheel.

Address: **Ex-Cell-O Corporation,** 1200 Oakman Blvd., Detroit 32, Mich.



Relief Valve

A low pressure relief valve for controlling gases such as nitrogen and carbon dioxide is produced by James-Pond-Clark.

Available for relief pressures ranging from two to 45 psi the new valves are supplied in either aluminum or brass and use the "Circle-Seal" principle of sealing, employing a standard "O" ring which is self aligning between two conical seats of a poppet type valve. Supplementing the "O" ring for pressures above six psi, a metal back-up ring floats with the "O" ring and prevents its undue expansion under pressure.

Address: **James-Pond-Clark,** 2181 East Foothill Blvd., Pasadena 8, Calif.

Technical Literature

MOTORS AND ACTUATORS: Two bulletins, Nos. 1351 and 1150, describe rotomotive equipment for standard and custom aircraft electric motors and electric and hydraulic actuators, and integrated electrical control systems for generators and alternators for both aircraft and ground use, respectively. Bulletins have been published by Jack and Heintz, Inc., Cleveland 1, O.

•

MAGNETIC AMPLIFIERS: Karl-Douglas Associates, 3160 W. El Segundo Blvd., Hawthorne, Calif., has issued a four-page brochure which deals with advantages of magnetic amplifiers over other power control amplifier devices, listing typical performance specs for 60-cycle and 400-cycle units.

•

VIBRATION ANALYSIS: Features and utilization of the Model 652 Vibratron instrument for vibration analysis and dynamic balancing are dealt with by International Research and Development Corp., Columbus, O., in a new four-page brochure.

•

MACHINE AND CUTTING TOOLS: Catalog No. 27312 is available for use by purchasing departments and engineers interested in checking basic machine specifications and descriptions of the products manufactured by the Ex-Cell-O Corporation, 1200 Oakman Blvd., Detroit 32, Mich.

•

PAINT AND PRIMER: New 16-page Bulletin No. 730 describes Tygon paint and Tygorust primer, new corrosion-resistant coating. It is available from U. S. Stoneware Co., Akron 9, O.

•

SPEED CHANGERS: Metron Bulletin No. 100 (Revised) details the miniature fixed ratio speed changers offered in over 400 ratios for fixed ratio gearing problems in instruments, servomechanisms, controls, and regulators manufactured by Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.

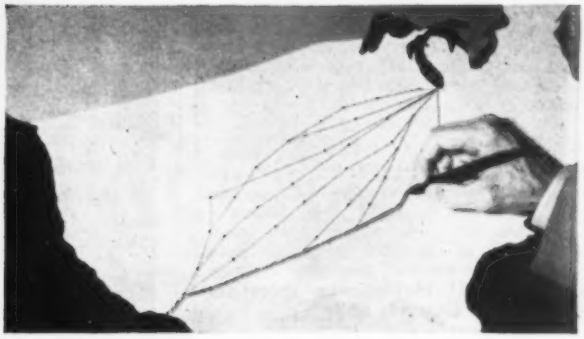
PHOTO CREDITS

Cover: United
—Ankers
38—North American
—Northrop
—Beech
—National
—Infos. Aero.
—Republic
—Douglas

Daily Service to Alaska
FROM SEATTLE AND PORTLAND
in comfortable 4 engine
PNA Flaglines
To Anchorage
NON STOP FROM SEATTLE $75.00*
DIRECT FROM PORTLAND $82.00*
*plus tax
21st YEAR OF SERVING ALASKA
PACIFIC NORTHERN AIRLINES
The Alaska Flag Line
Call your travel agent for schedules and reservations or write:
General Traffic & Sales Office 1626 Exchange Bldg., Seattle 4, Washington

On United Air Lines you fly where the weather is best *today*

1. YOUR CAPTAIN, his First Officer and one of United's meteorologists are studying the latest weather maps at their routine preflight conference. Weather is always shifting—and today it's least favorable over Kansas. But United's Multiple Route system allows them to plan the flight to the southward *around* this weather.

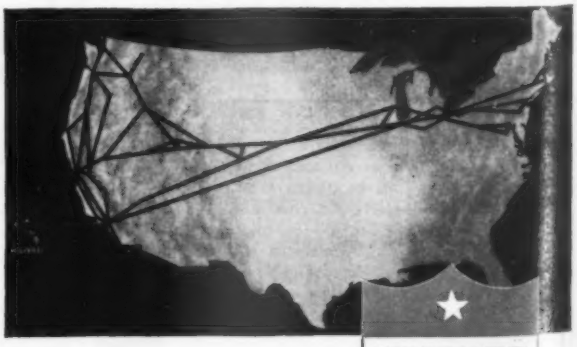


2. HERE'S THE ROUTE SELECTED. Notice that it's one of many available to United Air Lines. For example, between Chicago and Los Angeles there are Multiple Routes across Texas as well as far to the north. There are similar route-patterns between other cities —all marked by radio beams for precision navigation.

3. YOUR DC-6 MAINLINER® has a nonstop range of over 3,000 miles. Its four mighty engines can develop more horsepower than a locomotive. Your Captain can call on a tremendous reserve of range and power—or he can utilize favorable tail winds—to fly a longer route and still get you there on time.

4. YOU GET A VARIETY OF SCENIC TREATS as well as the smoothest, sunniest route. Whenever possible, flights are planned to pass over scenic attractions, such as the Grand Canyon or the Painted Desert in the south, or Yellowstone National Park if you're traveling a northern route.

5. YOU ARRIVE ON TIME after flying *around* the weather. With their pressurized cabins, DC-6 Mainliners can also fly at altitudes high *over* the weather with low-altitude comfort for you. You enjoy smooth flights and all-season dependability when you fly United—the airline that offers not one but many "sunshine routes."



COMPARE THE FARE
AND YOU'LL GO BY AIR

For reservations call or write
United Air Lines or an
Authorized Travel Agent

UNITED
AIR LINES

COPR. 1953 UNITED AIR LINES

Airline Commentary

By Eric Bramley

KLM Royal Dutch Airlines is the eighth largest airline in the world in terms of revenue ton-miles. One of the reasons for this, according to the company's competitors, is that the Dutch are among the world's best salesmen. And a good example of salesmanship is KLM's latest promotional piece.

The presidents of all U.S. airlines that are interline partners of KLM, plus other airline officials around the world, recently received from KLM a bound set of seven maps, together with an accompanying letter from **F. von Balluseck,** executive vice president-traffic. The maps cover the world, showing KLM routes in solid lines, others in dotted lines. Each map is accompanied by pages containing alphabetical lists of names of cities, a list of interline partners, and KLM connecting points.

The maps are intended to give other airlines a quick picture of possible itineraries via the KLM system. For actual booking, specific connecting data, it will be necessary to use the *Official Airline Guide.*

It's a novel visual presentation—one that will attract attention and which should produce results.

•

A case recently came to our attention involving an airline (scheduled) which, on a coach flight with 55 adults and eight children, left 63 pieces of baggage behind. The payoff was that the passengers *weren't told* that their baggage wasn't aboard. This was an overwater flight, and the reason (given us by the company) for leaving the bags was that bad weather in the vicinity of the terminating point made it necessary to carry a maximum gas load.

When the passengers arrived in U.S. Customs, they stood around a long time waiting for their baggage, which never showed up. A message had been sent from the flight's originating point, explaining the situation, but it didn't get there until well after the trip had arrived. The bags came in on a much later flight.

The fact remains that the passengers weren't informed. Some of them were making connections to far-distant points. This is a prime example of how not to win friends and influence people. Probably not one of those passengers will ride that airline again. A reasonable explanation would undoubtedly have helped immeasurably.

•

Ed Bern, Pan American-Grace Airways' vice president and sales manager, is always thinking up new gimmicks to sell Panagra. Several weeks ago he decided that, through use of the almighty dollar, he'd really make people read his direct-mail promotion.

To 1,800 travel agents and 1,500 airline sales representatives he sent a letter: "One will get you 10 if you tell your clients to board Panagara at Miami for South America, you'll have a satisfied customer, and one will get you 10 that if you tell your employes of the 10 great advantages of Panagra's service . . . your sales are going to be higher." The 10 reasons were listed and a dollar bill was attached.

Today he has mail from all over the U.S., plus Alaska, Singapore, Casablanca, Hong Kong, Calcutta, Belgian Congo, and other points. Reaction was excellent. From Helsinki he received a 500 mark note with a letter saying "500 will get you 5,000 that if your fine airline sends us some timetables and promotional material we will be able to do much more selling Panagra in Finland."

Other comments: "We shall adopt it in our next sales letter to agents. . . . The dollar will be given to the first salesman who makes a sale of over $200 on Panagra. . . . We now have one and are going after 10. . . . Here's an exchange order for two drinks in Cleveland. . . . I put three Round South America's on last week. . . . One will get you 10 that everyone receiving it will read it. . . ."

Ed thinks that his dollar investments have paid off.

REDUX®

OPENING A NEW ERA IN AIRCRAFT ENGINEERING

The achievement of ways and means to assemble aircraft components with the "Redux" Process as developed by Dr. N. A. de Bruyne, Ciba's distinguished associate from England, has won widespread engineering and public attention both here and abroad.

The acceptance of the "Redux" Bonding Process by the aircraft industry is confirmed by the fact that it has been adopted as the standard procedure in the production of commercial aircraft such as the de Havilland "Comet" and the Bristol "Britannia," as well as in a number of British military types. "Redux" bonding also is being used extensively for specially designed high-speed jet-fighters in this country.

In response to long-standing invitations from American universities, engineering societies and aircraft companies, Dr. de Bruyne is now making a specially arranged lecture itinerary to appear before these groups from coast to coast.

REPRINTS OF PUBLISHED PAPERS BY DR. DE BRUYNE ON THE "REDUX" PROCESS *and related data sheets have been assembled in a special reference file folder to serve as a preliminary guide to aircraft engineers in evaluating and using the "Redux" bonding process. Complete engineering assistance and information on the use of the process are available from Ciba. Address . . . Plastics Division, Ciba Company Inc., 627 Greenwich Street, New York 14, New York*

CIBA
PLASTICS

Reopening of NY-Balboa Case Dropped

Faced with a political hot potato in the early days of the new Administration, the Civil Aeronautics Board last week cut short efforts of several airlines to reopen for further arguments the controversial New York-Balboa Through Service Proceeding.

Pan American, Panagra, and Eastern wanted CAB to weigh "new evidence" which they felt warranted a different decision from that reached by CAB but not yet released because of the need for White House approval. Braniff and National, apparently satisfied with the Board decision, opposed reopening the case.

President Truman avoided signing the decision during the last six months of his term and returned it to CAB for resubmission to President Eisenhower. When AMERICAN AVIATION revealed the case was back at CAB, a flood of petitions greeted the Board and a political dilemma appeared in the making.

CAB cut the action short, however, by refusing to hear further arguments. The controversial decision proposes linking Braniff and Eastern in one interchange between New York and South America and Pan American, Panagra, and National in another in the same market. Pan Am, Eastern, and Panagra had been fighting for approval of a voluntary interchange agreement in which all three would participate.

CAB to Study Own Action in Rate Case

When a government agency acts on the advice of its staff and investigates a private firm, it's routine. But when a government agency acts on the advice of a private firm and investigates its staff, it's news in the making.

Essentially, such a situation is developing in the National Airlines Final Mail Rate Case in which CAB has agreed to hear public arguments on charges that its staff "unnecessarily delayed" the rate case, thereby cutting into National's profits. National claims "millions" may be involved.

Since January 1, 1952, National has been on a permanent rate basis receiving what CAB considers a non-subsidy rate of 53c per ton-mile. But rates have not yet been set for the 4½-year period prior to January, 1952, the period during which National alleges the "delay" occurred.

By failing to establish final rates before January 1, 1952, National claims, CAB thus exposed much of National's current profitable period to possible recapture action by the Government.

On weighing the evidence thus far, CAB concluded the airline's charges are "novel and important" and should be presented orally before the full Board. Thereafter, the Board said, if the charges appear "relevant," they will be considered by the Board when determining the carrier's appropriate final rate for the "open" period.

CAB BRIEFS

Department of Defense has endorsed CAB's proposal to prescribe the way in which airlines must secure funds to pay judgments against them arising out of aircraft accidents. Arguing before the Board, Maj. Morton Nesmith said the military has regulations setting up **insurance requirements** that must be met by air carriers using military bases.

The military's insurance requirements are higher than those named in CAB's proposed "financial responsibility" regulation and Nesmith urged CAB to up its proposed requirements.

Meanwhile, **Stuart G. Tipton,** general counsel for the Air Transport Association, told CAB that the regulation would mean 'drastic changes' in airline insurance programs, while Warren E. Miller, attorney for Aircoach Transport Association, claimed CAB does not have the power to enforce the regulation.

Trans World Airlines asked CAB to include Syracuse, Rochester, and Buffalo on the Chicago-New York segment of its transcontinental route, to grant non-stop rights between Detroit-New York and Detroit-Chicago, and to lift restrictions attached to service to Cleveland. In another application, the carrier renewed its bid to serve Denver as an intermediate point on its transcontinental route.

•

Philippine Air Lines' bid for a **San Francisco-Mexico City route extension** is meeting with strong opposition from one U. S. air carrier, Western Air Lines, which feels the award should be held up until Western is free to activate "its own long-certificated service between Los Angeles and Mexico City."

Authorizations for U. S.-Mexico operations of Western and other U. S. carriers are inactive.

CAB News

AS OF NOW . . .

Two important interchange proceedings will get under way during the next month. One, the **United-Braniff Interchange Case,** will start with hearings on March 16 in Washington. It centers around through service between Houston and other intermediates on Braniff's Route 9 south and east of Denver, and Seattle and intermediates on United's Route 1 north and west of Denver.

The other, slated for hearings March 4, is the **United-Continental Interchange Case,** involving through service between points on Continental's Route 29 south and east of Denver and points on United's Route 1 above Denver.

The **Pioneer Air Lines Mail Rate Case,** involving the company's switch from DC-3's to Martin 2-0-2 equipment, gets a final public airing at oral argument before CAB on February 24.

Hearings have ended in the **Colonial Airlines Merger Proceeding** after parties amassed a record second in volume only to the current non-scheduled airline investigation. Next step in the case is filing of briefs, which are due March 26.

Formal procedural steps in the **Delta-C&S Merger Case** are completed but a final CAB order, transferring certificates to the merged firm, is necessary before consummation of the deal. This will take place probably in April, after stockholder approval and compliance with CAB labor provisions.

CAB DECISIONS

• **Island Air Ferries** denied reconsideration of CAB order which refused to renew the line's local service airline certificate.

• **Bonanza Air Lines'** airport notice for service to El Centro, Calif., through Imperial County Airport approved on less than statutory 30 days notice.

• **North American** Airlines use of the name "North American" set down for investigation upon complaint of American Airlines.

CAB CALENDER

Feb. 23—Hearing in Trans-Atlantic Cargo Case (Seaboard & Western, et al.) Washington, D. C. (Docket 3041 et al.)

Feb. 24—Hearing in Air America, Inc. Enforcement Proceeding. Washington, D. C. (Docket 5766).

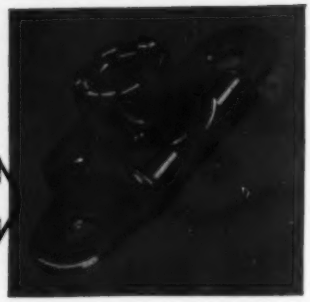
Feb. 24—Hearing in Airlines Reservations et al. Enforcement Proceeding. Washington, D. C. (Docket 5878).

Mar. 2—Hearing in Western Air Lines Mail Rate Case. Washington. (Docket 5148).

floating anchor

MEANS SAVINGS IN ASSEMBLY TIME VIA

plate-lok



The established efficiency of BOOTS' line of all-metal self-locking nuts is emphasized by the internationally used PLATE-LOK. The BOOTS PLATE-LOK affords weight savings of 33%...functioning smoothly in temperatures from sub-zero to 550° F, and complying with AN-N-5 and AN-N-10 specifications. With one or two lugs and right angle base, for regular or counter-sunk rivets, for welding, the incomparably efficient FLOATING ANCHOR PLATE-LOK, is the perfect self-locking nut when float is needed. *The versatility of the PLATE-LOK is further accentuated by its use with:*

gang channel

Removable or permanent... in standard length channels...wide range of spacings. (Special spacings can be ordered.)

anchor bases

Plain anchor...one lug...corner... midget and right angle. Positive locking action is assurance against failures due to vibration and extreme temperature changes.

For any lock-nut problem, consult BOOTS Engineers. Experimental quantity supplied at no charge. Specifications and necessary technical data on the complete PLATE-LOK line available in our catalog. *Free* –

WRITE:

BOOTS Aircraft NUT CORPORATION

NORWALK, CONNECTICUT

WORLD'S PREMIER AIRPLANE FABRIC

lighter · stronger · smoother

FLIGHTEX

FLIGHTEX FABRICS, Inc. · 93 WORTH STREET · NEW YORK 13, N.Y.

Leading Manufacturers of Fabric and Tapes for the Aircraft industry.

FLIGHTEX FABRIC

Export Representative AVIQUIPO, Inc. 25 Beaver Street, N. Y. Cable: Aviquipo

People

MANUFACTURING

Boone T. Guyton has been named manager of Government sales and service for Norden Instruments, Inc. Guyton, along with his government sales activities, will continue his responsibility for the company's field program.

S. A. Meacham has been appointed aviation sales manager for the Bendix Radio Communications Division of Bendix Aviation Corp.

Earl D. Foster has been appointed superintendent of gas turbine production in Solar Aircraft Company's manufacturing division at San Diego.

John W. Mazur, former head of the engineering section, rotary wing branch, at the Naval Air Test Center in Patuxent, Md., has joined Doman Helicopters as chief design engineer.

Norman W. Barker has been made purchasing agent for Texas Metal and Manufacturing Co. Barker was previously purchasing agent for Mid-Continent Airlines.

Grant A. Sattem has been promoted from general sales manager to vice president in charge of sales for Luria Engineering Co. Before joining Luria in 1948, Sattem was manager of the Horlick Racine Airport at Racine, Wis.

Sattem

Wood

Lysle A. Wood has been named to the newly created post of director of pilotless aircraft for Boeing Airplane Company. Wood, who joined Boeing in 1926, has been the company's chief engineer since 1948.

AIRLINES

Felix Menage is the new manager of the Philadelphia district for Air France. Prior to this promotion, Menage was acting manager of Air France's district office in Chicago. **Pierre Arozarena**, a veteran of 17 years with Air France, will take over the Chicago post, as manager of the midwestern district.

Douglas A. Hibbs has been named district sales manager in New York for Northeast Airlines. Hibbs, former d.s.m. in Northeast's Cape Cod and Island area, replaces **John Young**, resigned.

Ronald A. Keith has been named assistant to the president of Canadian Pacific Air Lines. Prior to joining Canadian Pacific, Keith was editor of *Canadian Aviation* magazine.

T. W. Cummins, formerly director of flight regulations, has been apointed administrative assistant to **Frank C. Judd,** vice president-operations for Northwest Airlines.

Captain Harvey M. Thompson is the new chief pilot for Allegheny Airlines (formerly All-American Airways). Captain Thompson will make his headquarters in Washington.

Captain J. J. Busch has been appointed general manager and chief executive officer of New Zealand National Airways Corp. Busch, who joined NZNAC when the corporation was formed was, successively, assistant operations manager and operations manager, prior to this latest appointment.

Harold K. Saunders has been elected to the position of vice president-operations of Piedmont Aviation. Prior to his election as vice president, Saunders was director of operations.

Allan F. Bonnalie has been named to the newly created post of director of United Air Lines' flight training department. Bonnalie, until recently president and general manager of LAMSA, United's Mexican subsidiary which was sold last July, will have charge of the flight training center at UAL's Denver base and the synthetic training divisions to be organized later this year at Denver and Chicago.

Edward K. Ellis has been named district sales manager of Braniff Airways at Oklahoma City, succeeding **Charles W. Gray,** resigned. Previously, Ellis was city sales manager in Dallas.

Thomas W. Collens has been made assistant district sales manager for Northwest Airlines in Washington, D. C. Prior to his appointment in Washington, Collens was district sales manager for Northwest in Pusan, Korea.

George F. Attwood, former station manager for Southern Airways, has been promoted to superintendent of station, replacing **John A. Maxham,** resigned.

Norman K. Arnold, who joined Southern Airways in October, 1951, has been elected vice president-traffic and sales for the airline. Arnold will have headquarters in Southern's general offices in Birmingham and in the line's sales and operations offices in Atlanta.

MILITARY

Brig. Gen. Samuel Russ Harris, Jr., present Chief of Staff of Air Research and Development Command Headquarters in Baltimore, has been named to command the U. S. Air Force's Arnold Engineering Development Center, Tullahoma, Tenn.

Dr. Robert W. Cairns, assistant director of research for the Hercules Powder Co., has been appointed one of the two vice chairmen of the Department of Defense Research and Development Board.

Brig. Gen. George S. Cassady has been named deputy commander, Continental Division, Military Air Transport Service, at Kelly Air Force Base.

The following employes have recently completed 20 years or more of service in the aviation industry.

• **Lysle A. Wood,** Boeing Airplane Company. Director of pilotless aircraft, Seattle. 26 years (see Operations-Engineering, above).

• **Clara Schaurer,** American Airlines. Chief clerk, cargo sales, New York. 20 years.

• **Jack Sebastian,** Solar Aircraft Company. Heat treater, San Diego. 20 years.

• **E. A. Keogh,** United Air Lines. Staff superintendent-surplus property, Chicago. 25 years.

• **Ed Nelson,** United Air Lines. Lead building and maintenance mechanic, Chicago. 25 years.

• **D. R. MacLaren,** Trans-Canada Air Lines. Executive assistant, Pacific area, Vancouver. 24 years.

• **T. L. Brandon,** American Airlines. Supervisor, operations, Nashville. 20 years.

• **H. T. Myers,** American Airlines. Captain, Fort Worth. 20 years.

• **R. J. Bentz,** American Airlines. Captain, San Francisco. 20 years.

• **W. W. Davies,** United Air Lines. Manager, aircraft engineering, San Francisco. 20 years.

• **W. H. Stone,** United Air Lines. Flight dispatcher, Seattle. 20 years.

as new as jet airliners!

THE H-6B GYRO-HORIZON
DESIGNED FOR HIGH-SPEED AIRCRAFT

The new Sperry H-6B Gyro-Horizon provides *accurate indications—up to the speed of sound.* This significant advance has been achieved through the development of special temperature compensated parts, stainless steel gimbals, and stepped up gyro efficiency.

In keeping with the new speeds in jet transportation, the H-6B Gyro-Horizon also features improved quick-erection mechanisms. These incorporate a new, manual instantaneous starting-setting.

Again Sperry's advanced research and engineering is meeting the demands of increased speed . . . *with speed.* Our Aeronautical Department will be glad to supply complete information upon request.

FEATURES OF THE H-6B

Improved bezel presentation . . . with maximum reduction of parallax to eliminate angular distortion, improved reference airplane and adjustment, increasing cone of visibility, and elimination of working parts affecting visibility. Three phase circuit protection indicator Minimum of turning error • Non-Tumbling Freedom of roll through 360 degrees

SPERRY GYROSCOPE COMPANY
DIVISION OF THE SPERRY CORPORATION

GREAT NECK, NEW YORK • LOS ANGELES • SAN FRANCISCO • SEATTLE • CLEVELAND • NEW ORLEANS • BROOKLYN
IN CANADA • SPERRY GYROSCOPE COMPANY OF CANADA, LIMITED, MONTREAL, QUEBEC

International Report

MODEL of Vickers VC-7

Vickers VC-7 May Replace BOAC Comets

A new jet transport design, the Vickers VC-7, powered by four Rolls-Royce Conway by-pass engines, is a likely successor to BOAC's fleet of de Havilland Comet 1, 2, and 3 jetliners.

The 100-150 passenger VC-7 is the commercial version of the Vickers 1000, a military jet transport incorporating certain features of the Vickers Valiant jet bomber. Britain's Ministry of Supply has ordered a prototype of the Vickers 1000 and is believed to have put the Conway on the super-priority list.

BOAC Chairman Sir Miles Thomas has disclosed that the VC-7 specification was developed by Vickers-Armstrongs Ltd. in conjunction with the airline. During the past six months BOAC men have been cooperating with the manufacturer "so that our experience and requirements could be incorporated in the design," Sir Miles added. He made no actual mention of any BOAC orders for the VC-7.

Questioned by an AMERICAN AVIATION correspondent shortly before the official VC-7 announcement, Sir Miles said that the civil versions of Britain's three super-priority long-range bombers would be flying in 1960 (this seems to be a conservative date so far as the VC-7 is concerned).

Span of the Vickers 1000 (and presumably also of the VC-7) about 140 feet; length, 146 feet; and height, 38 feet 6 inches. The economical Conway by-pass will give the aircraft high subsonic speed and very long range.

Australian National Calls for Mergers

Australian National Airways has called for a merger of the four major airlines of Australia—Trans-Australia Airlines, Qantas Empire Airways and British Commonwealth Pacific Airlines. The reason for the ANA proposal is stated to be the privately-owned airline's doubts as to the continuation of its present equal status with TAA should a change of government occur.

Confusion, Delay Mark Off-Shore Program

The Mutual Security Agency's off-shore procurement program for complete aircraft, which should have got under way last July, has bogged down into complete confusion as far as programming is concerned. There is indication that two of the three aircraft originally in the program have been dropped and that the manufacturing roles to be played by the Dutch, Belgian and Italian industries have been eliminated.

In its present—still very fluid—state, the program centers around the Hawker Hunter—the MSA mission in London has offered to place a $70,000,000 order with Hawker Aircraft provided deliveries of the swept-wing interceptor can be completed by the deadline of July 1, 1955, imposed by the U. S. Congress. This deadline was a factor in the elimination of the Vickers-Supermarine Swift from the program—certain essential modifications to the wing and control would retard production and make it doubtful whether the deadline could be met.

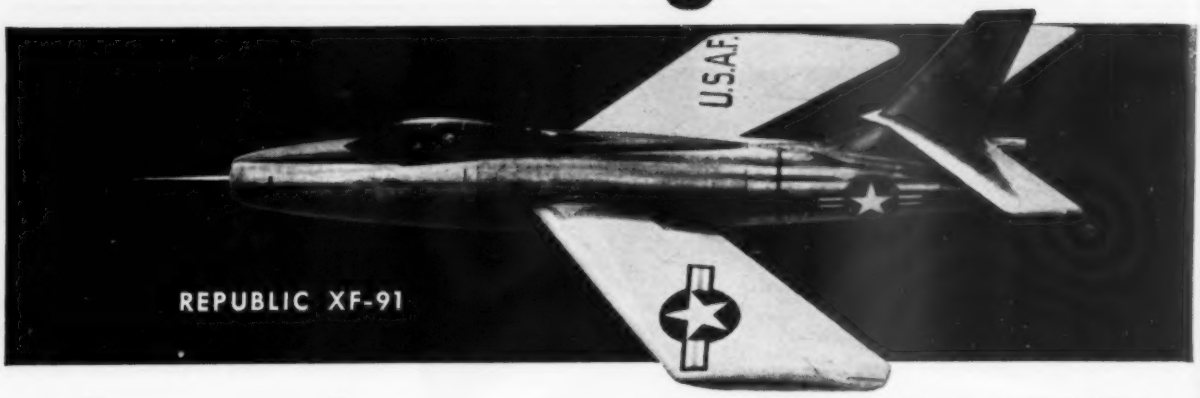
Reason for the elimination of another of the originally scheduled aircraft, the de Havilland Venom, is basically the fact that this model would be obsolescent by the time it could be produced in quantity by the Italian industry. It will probably be replaced by the Gloster Javelin from British production. The Dassault Mystere IV, France's contribution to the MSA program, will not be affected by the rescheduling.

The bogging down of the MSA program and the possibility that the Eisenhower administration will curtail supplies of U. S. military aircraft to the NATO countries is causing some hard thinking in Europe, particularly in the smaller countries.

Basically three fighters form the core of the European fighter force today—the de Havilland Vampire, the Gloster Meteor and, to a lesser extent, the Republic F-84 Thunderjet. The smaller European countries, such as Norway and the Netherlands, have no budgetary provision to buy large quantities of fighters and are counting on free supplies of American and British planes. France and Italy would be even worse off if external military aid were not available.

Perhaps no country in the world

Variable Wing Incidence



depends upon VICKERS HYDRAULIC MOTOR

INSTANT RESPONSE

HIGH TORQUE

LOW INERTIA OF MOVING PARTS

EXCEPTIONAL HORSEPOWER TO WEIGHT RATIO

CAN BE STALLED INDEFINITELY WITHOUT DAMAGE

PRESSURES TO 3000 PSI

For the first time, in Republic's new XF-91 Interceptor, the wing incidence is *adjustable in flight* by the pilot to provide a high angle of attack for low takeoff and landing speed . . . a thin razor-like attack angle for extreme flight speed.

The heart of the adjustment gear is a Vickers MF-3915 Hydraulic Motor which drives a screw jack to do the wing positioning. Characteristics provided by this motor are essential to the success of the mechanism. The extremely low inertia of the moving parts gives this motor the instant response vital to exacting flight conditions without the need for an auxiliary clutch or brake. It can be started, stopped and reversed almost instantaneously and no excess energy absorbing device is necessary. This permits elimination of over-run, and exact positioning of the wing. Other important characteristics of this motor, not generally available by other means, are exceptionally high torque, lighter weight, remarkable compactness, freedom from radio interference, ability to stall indefinitely without damage, easy installation and unusual dependability.

Vickers Hydraulics have helped make aviation history for years in both military and commercial planes. Write for new Motor Bulletin 5205.

Vickers Model MF-3915 Series

VICKERS Incorporated
DIVISION OF THE SPERRY CORPORATION
1502 OAKMAN BLVD. • DETROIT 32, MICH.

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

has so many disillusioned aircraft industry men as Italy. The "last straw" for the Italians was the decision to eliminate an Italian-built version of the de Havilland Venom all-weather fighter from the U. S. off-shore procurement program. This means that in a couple of months' time—when the Italian Vampire line ends—there will be no combat aircraft in production; in fact, there will be virtually no production of any type of aircraft.

Most affected by the Venom cutback are Fiat and Macchi, together with the engine firm of Alfa Romeo. Fortunately for them, all three companies have healthy divisions manufacturing non-aeronautical automotive equipment. Should the outside world look more kindly on them, both Fiat and Macchi have some promising aircraft of their own designs—the Fiat G-80/81/82 jet trainers and the Macchi MB 324 jet fighter are among the best.

Another big company, Piaggio, has developed some excellent primary trainers but, with production of these models becoming increasingly unlikely, the firm's main resources are engaged on non-aeronautical work (Piaggio's continued existence after the war was due to an excellent little motor scooter which is still in production).

Two of the pre-1943 giants of the Italian aircraft industry, Caproni and SIAI Marchetti, are still shadow companies; the latter is still hopeful of returning to its former predominant field—transport aircraft production.

Caproni, like SAI Ambrosini—perhaps the most lively of all the Italian companies—is hoping to get into the jet-powered basic trainer or personal plane with its F-5. This field is also being developed by the Italian aircraft firm that has been very lively in recent years—SAI Ambrosini; this company has had a limited success in selling its piston-engined personal planes and trainers and is now test flying a jet model known as the Frecchia.

NEWS BRIEFS

The Dutch Air Force is now half way toward reaching its planned strength of **21 squadrons.** It now has six day fighter squadrons (Gloster Meteor 8, four tactical squadrons (Republic F-84 Thunderjets) and one transport squadron (Douglas C-47). Biggest deficiency is in all-weather fighters.

• •

Shortly prior to the hearings on Canadian Pacific Air Lines' application to start **all-cargo service from Vancouver** to Toronto and Montreal, Trans-Canada Air Lines announced reductions of its air cargo rates by an average of 30%.

First flying photo of the Hurel Dubois HD 31, prototype of the HD 32 "Douglas DC-3 replacement" which was described extensively in the AMERICAN AVIATION of February 2. The first flight of this French model took place at the end of last month.

Second Britannia Prototype Due

The second prototype of the Bristol Britannia turboprop transport is expected to be made this summer. The first two production aircraft are scheduled to fly early in 1954. Since August 16, 1952, when the first prototype made its maiden flight, the aircraft has carried out 48 flights, logging 46½ hours. It recently returned to the factory for resonance tests and will soon start the second phase of its flight test program.

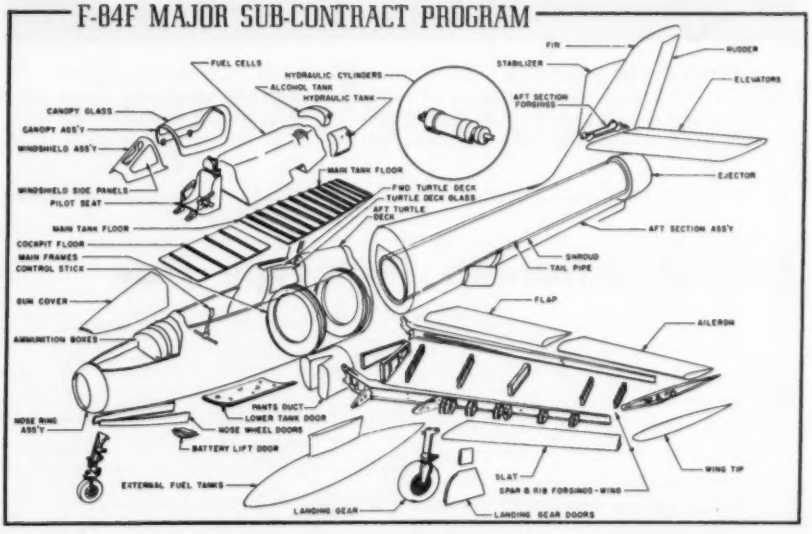
Bristol reports that "no trouble of a serious nature has been encountered and no major modifications . . . have been called for." The first prototype has so far been flown at gross weights of up to 125,000 pounds, and at center-of-gravity positions varying between 12% and 35% standard mean chord.

As a result of the flight tests, certain design modifications have been made to the Proteus turboprop engine:

- **Refinement** in the compressor-rotor thrust-bearing giving improved bearing cooling;
- **Detail improvements** in the reduction gear designed to give extended life at the higher powers now being extracted from the engine;
- **First and twelfth stage** compressor-rotor blades have been revised to obtain increased fatigue life;
- **Compressor blow-off valves** and operating system are being modified "to give complete reliability."

SNCASCO SO 30 transport is used as flying test bed for the Atar turbojet, the first French designed turbojet engine slated for production. The plane made its first flight at the end of last month.

Turbo-compound Super Constellation, shown in its first portrait, is being moved from the first final assembly hangar to another where interiors will be installed, prior to flight test. Lockheed luxury liner will cruise at 350 mph and can approach a maximum of 400 mph. Backlog of commercial orders exceeds $100,000,000.



About half of Republic's F-84F Thunderstreak will be built by the more than 2,200 subcontractors, raw material sources, and equipment suppliers. During 1952 Republic paid out $200 million to other companies for parts and equipment. It is estimated that more than 45,000 people produce F-84 equipment, double the number of workers on Republic's own payroll.

The Production Picture

Weighing-in of new Boeing XB-52 is accomplished by lifting plane off the floor with jacks attached to the fuselage. It is then lowered onto the special weighing jacks placed between the four sets of landing wheels. With fuselage jacks off the ground, the weight is recorded by the cells in the weighing jack, which transfer data to the electrical weighing machine at right.

Plastic radome shown on Douglas Navy R6D-1 is thermally protected against ice formation by new manufacturing technique developed by Douglas Aircraft Company. "Lost wax" fabrication process, which leaves a molded column interior when the fabricating wax is melted out, permits hot air anti-icing of the radomes, now in service on late model C-124 Globemasters, C-118A's, and R6D Liftmasters.

NEWS BRIEFS

Convair has reported a **net income of over $10.4 million** for the fiscal year ended November 30, with a backlog at that time in excess of one billion. Convair's Federal tax payments on earnings jumped from 1951's $3.8 million to $9.5 million in '52.

• •

Net return on sales for **Bendix Aviation Corp.** slid from 3.5% to 3% in 1952 (fiscal year ended September 30), and president Malcolm P. Ferguson fingered higher taxes, price ceilings, and small profit margins on Government business as the roots of the evil. **Net for the year: $15.3 million,** or $7.22 a share.

• •

Beech Aircraft Corp. began its current fiscal year with a running start: net **for the first quarter,** ended December 31, was $489,808, as compared with last year's $278,388 for the same period.

• •

North American Aviation's net reached $2.28 a share, or $7,820,886, by the time its fiscal year ended last September 30. In the 1951 fiscal year the net had been $1.87 a share, or $6,421,612.

GREER DYNAMIC HOSE TEST BENCH tests statically one to six hose lines or similar components at pressures to 25,000 psi. Covered burst chamber provided for operator's safety. Above many hose assemblies are tested simultaneously.

Why Chance Vought Checks with Greer Testers

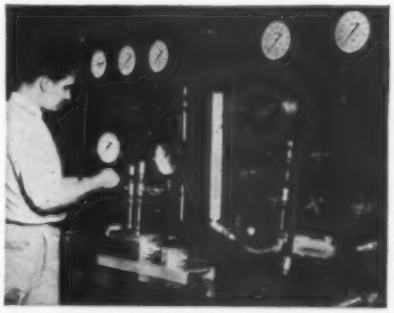
CHANCE VOUGHT'S CUTLASS AND CORSAIR, mighty single-place fighters, on a test run before being delivered to the U. S. Navy and Marines for combat.

Like other aircraft builders, Chance Vought relies upon the accuracy and dependability in Greer Precision Test Equipment

No one knows the urgency of accurate testing better than the men who build the famous Cutlass and Corsair. It is a fine tribute to the Greer reputation that Chance Vought chooses Greer equipment for vital testing operations.

Again and again, leaders in the aviation field turn to Greer for maintenance and test equipment. Pioneers in this field, Greer has standardized its machines until you can order them for most purposes right out of a catalog (write for your free copy on company letterhead).

For out-of-ordinary test or maintenance requirements, a staff of creative engineers is ready to talk with you at your convenience.

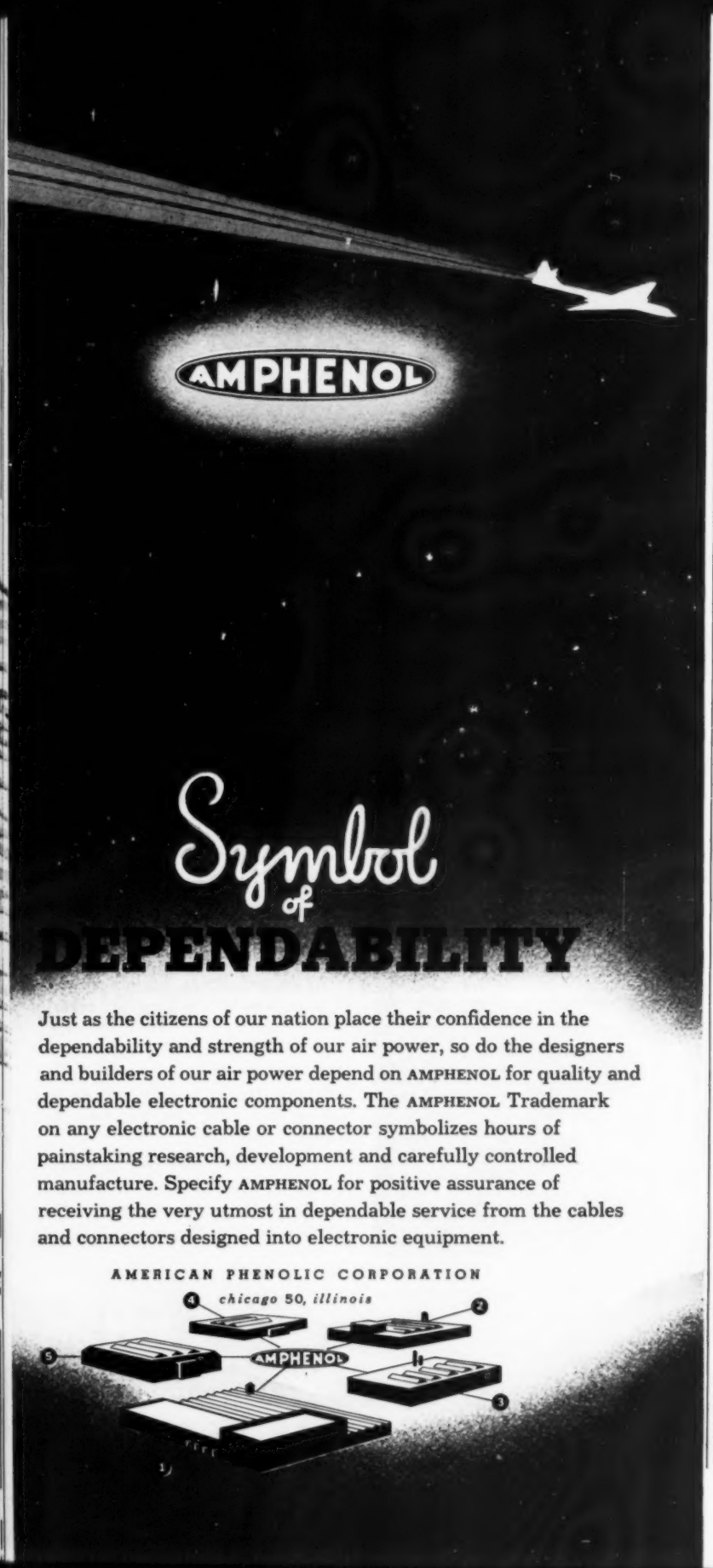


GREER DYNAMIC HYDRAULIC TESTER checks all hydraulic accessories except pumps. Operates with variable volume and pressure dynamic tests to 5,000 psi, static tests to 15,000 psi, flow rates to 16 gpm. Above, check valves for tandem boost of Cutlass are being tested.

GREER
TEST EQUIPMENT

Greer Hydraulics Inc. 454 Eighteenth St., Brooklyn 15, N. Y.

Field Offices: 407 S. Dearborn Street, Chicago • 298 Commercial Building, Dayton • 2832 E. Grand Blvd., Detroit and representatives in all principal cities • Also manufacturers of Accumulators and other hydraulic components


AMPHENOL
Symbol of
DEPENDABILITY
Just as the citizens of our nation place their confidence in the dependability and strength of our air power, so do the designers and builders of our air power depend on AMPHENOL for quality and dependable electronic components. The AMPHENOL Trademark on any electronic cable or connector symbolizes hours of painstaking research, development and carefully controlled manufacture. Specify AMPHENOL for positive assurance of receiving the very utmost in dependable service from the cables and connectors designed into electronic equipment.
AMERICAN PHENOLIC CORPORATION
chicago 50, illinois
AMPHENOL

Letters *(Continued from Page 8)*

successful development of mechanisms and of maintenance procedures that they have turned in excellent dependability records. In addition, the development of fundamentally simpler and more dependable rotor mechanisms has continued throughout the industry, and will shortly appear on production models.

While patiently continuing basic research progress, the hard core of the industry has, through the Helicopter Council of the Aircraft Industries Association, endeavored to give the military and the public a levelheaded picture of the present and future capabilities of the helicopter. I am sure that no council member is interested in the promotion of single-engine, single-pilot helicopter transportation in congested areas, and I feel that Mr. Littlewood's implications to the contrary are very unjust and misleading.

No informed person accepts the idea that single engine helicopters can safely operate over congested built-up areas, and it is my opinion that operating companies will have twin-engined reliable helicopters before they are psychologically and technically equipped to use them. Welch Pogue has been perfectly right for many years in arguing that the true long-term obstacle is the mass of existing ordinances which fail to differentiate between helicopters and "aircraft," thus prohibiting close-in use of the helicopter's capabilities.

No Blade Hinges

Our own organization is now entering production with a helicopter which has a rotor system of proven long life and which eliminates many hundreds of expensive parts and of maintenance operations. The ship is being sold currently as a single-engine machine but is designed for easy conversion to twin engines and will, we believe, permit the opening of many close-in commercial operations although the twin-engine version will only carry eight paying passengers. By eliminating blade hinges this ship enjoys a saving of scores of parts and approximately $20,000 in machining costs by virtue of the design of its rotor hub alone.

Mr. Littlewood overlooks the "hard fact" that these developments are a reality and are typical of the work being done through the industry. Even more spectacular development was required to put the fixed-wing transport business on its feet and he must not forget that more rapid current technological progress will accomplish the necessary changes in helicopters at a surprising rate.

I get the impression that he feels the helicopter is being proposed as a substitute for his existing fixed-wing systems. His critical comment on the fact that one must take a taxi to a downtown terminal applies also to the railroad, but the fixed-wing airlines will not get into the vast short-haul market until they actually make their departure from downtown centers.

Mr. Littlewood seems to miss the point that helicopter service is foreseen as a competitor for the railroad, not the fixed-wing airlines. The business will either be developed by present airlines or by other concerns with sufficient vision to realize its potential.

enough information to conclude that

I thank you for the opportunity to comment upon this matter which is of vital importance to all of us interested in the helicopter industry.

Sincerely,
GLIDDEN S. DOMAN
President
Doman Helicopters, Inc.

(Additional industry comment on this editorial, including an extensive report by Los Angeles Airways' president Clarence M. Belinn, will be published in the next issue of AMERICAN AVIATION*—Ed.)*

•

FROM CARTOONS, A KICK

To the Editor:

Just a note to tell you that I appreciate the fine coverage of the industry that you are offering these days in AMERICAN AVIATION.

Several of my friends and I have gotten a big kick out of your recent cartoon series on airline employees. If you offered enlargements of these (with the text included) suitable for framing, a lot of your readers, including myself, would very much like to buy them. What do you think?

Best wishes for your continued success as the aviation industry's reporter.

CHARLES SEILER
Eastern Air Lines
Chicago 3, Ill.

(Four of the more popular Chamberlain cartoons which have appeared in AMERICAN AVIATION *are being made available at 25c each to cover handling costs. Those available are the Pilot, the Mechanic, the Dispatcher, and the Radio Operator.—Ed.)*

•

USAF SAFETY

To the Editor:

I consider AMERICAN AVIATION as being among the top air magazines in the business. But in my opinion, Mr. Parrish's editorial ("How to Improve A. F. Safety") was a very regrettable piece. The editorial consists of ill-chosen statements and contains practically nothing constructive.

Its theme obviously is "Let the Air Force remain military and let the airlines handle air passenger transportation."

While no one will entertain the idea of the Air Force taking over the U. S. airlines, few will argue that transporting servicemen on routine training flights, in order to help them get home on deserved furloughs, is wrong.

Does Mr. Parrish insinuate that these ships should travel empty?

The editorial also contends that "too many rank amateurs in uniforms with low-ranking commissions are undertaking to fly plane loads of military personnel . . ."

I am sure that it is not necessary to advise Mr. Parrish that a pilot's flying capability has very little to do with his rank. It has a great deal to do with the type of assignment he is given.

It is very possible for an officer to reach the grade of Colonel or higher with less than 1000 military pilot hours.

Similarly, it is also possible for the same officer to log several thousand pilot hours before getting any higher than 1st Lieutenant.

I subscribe to most of the aviation magazines now being published and from their contents I have obtained

For the Safety and Comfort of Passengers and Crews

THE PROBLEM Central Airlines, operating a fleet of DC-3's at altitudes not normally requiring oxygen, was faced with the necessity of providing oxygen for crews and passengers in order to use alternate airports.

THE SOLUTION The Scott 8500 Oxygen System was recommended by Air Associates, Dallas, to J. C. Daniels, Central Purchasing Agent, because of the unusually low cost, easy installation and quick servicing.

The installations were planned by E. E. McCory, Director of Maintenance. The oxygen cylinder was mounted in an accessible cargo compartment. The regulator and gauges are behind the co-pilot with three outlets to serve the pilot, co-pilot and jump-seat passenger. A line from the regulator supplies four passengers. These adequate yet simple installations were made at the modest cost of $415.00 per plane, including labor.

Write for literature on this adaptable equipment.

Crew installation including provision for jump-seat occupant. All crew using A-8-B Rubber Masks.

Four-passenger installation. Scott Disposable Masks being used.

Scott

SCOTT AVIATION CORP.
212 ERIE STREET LANCASTER, NEW YORK
Export: Southern Oxygen Co., 157 Chambers Street, New York 7, N. Y.

Northrop's Prime Equation

Northrop *boundary-layer research scientists,* like the man above, are concerned with complex problems aimed at achieving the maximum efficiency in aerodynamic surfaces at high speed.

Equations are used to solve problems. At Northrop Aircraft, the prime equation combines teams of administrators, outstanding scientists and production specialists with modern industrial and research facilities. The combination efficiently converts imagination and knowledge into actual matériel of advanced design and incalculable value.

NORTHROP AIRCRAFT, INC.
HAWTHORNE, CALIFORNIA
Pioneer Builders of Night and All Weather Fighters 8A12

enough information to conclude that even the civil airlines (whom Mr. Parrish champions in this instance) have little to snort about along the lines of training and maintenance.

Pilots shutting gust locks in flight; attempting to fly contact during instrument conditions; landing in the Flushing Bay just short of the runway. Maintenance men failing to install carburetor diaphragms, even though such procedure is specified; the use of questionable prop reversing mechanisms; published squabbles between airline personnel because pilots apparently don't help the stewardesses carry their equipment off the plane.

Are these prime examples of the type of "training and maintenance" that Mr. Parrish would urge upon the Air Force?

And one prominent scheduled airline got me from Seattle to Los Angeles —a 5-hour run—in a little over 10 hours recently.

Is this an example of "routine air transport" in a "highly specialized industry"?

The Air Force has recently had a tendency to remove the cloak of secrecy surrounding its air crashes.

Inasmuch as the USAF uses the same types of transport aircraft as the airlines, the information derived from these crash reports will prove of value to all.

Let us not cause the Air Force to pull back into its military secrecy shell because of criticism from the nation's press—less it be constructive criticism, which no one will condemn.

RICHARD LEONARD

(The editorial was not intended to say that the military should turn over all transport functions to the civil airlines, but that air transport operations were highly specialized and had not been given such specialized treatment and segregation by the military. It was recommended that the military bolster MATS, which was created for the specific purpose of providing air transport functions. —Ed.)

EMMET-INDUSTRIES, INC.
Bucking Bars and Rivet Sets
14551 Lesure Detroit, Mich. Ve 86990

FOR SALE

Airline Training School, est. 1940 is for sale due to year long illness of elderly owner. Enjoys excellent reputation with industry. Attractive quarters with favorable lease and modern equipment. Netted over $30,000.00 year prior to illness. Complete staff and up to date curriculum for day, evening and home study courses for all ground positions including Commercial pilot written and hostess. C.A.A. rated. Price $35,000.00—$12,000.00 down. Write J. Ruark, Box 2507, Hollywood, Calif.

AMERICAN AVIATION DAILIES, back issues, 9½ yrs. Complete from July '43. Clean, excel. cond.; boxed FOB Wash., D. C. Offers invited. HEW, 129 W. Leland St., Chevy Chase, Md.

THE BULLETIN BOARD

Undisplayed Advertising: $1.00 per line, minimum charge $4.00. Cash with order. Estimate 30 capital letters and spaces per line; 40 small lower-case letters and spaces per line. Add two lines if Box Number is included in lieu of advertiser's name and address.

Displayed Advertising: $10.00 per inch for less than 15 inches in one issue or in any 12-month period. For more than 15 inches, $8.50 per inch; more than 30 inches, $8.00; more than 60 inches, $7.50; more than 90 inches, $7.00; more than 120 inches, $6.50. Space units up to full pages accepted in this section for classified-type advertising.

Forms close 20 days preceding publication date. Address all correspondence to Classified Advertising Department, AMERICAN AVIATION PUBLICATIONS, 1025 Vermont Ave., N. W., Washington 5, D. C.

HAMILTON STANDARD
PROPELLERS-GOVERNORS-PARTS
LARGE INVENTORY
Advise Your Requirements
EDRAND AVIATION COMPANY
6111-21th Ave. So., Seattle, Wash.
LAndr 7871

AIRLINE PILOT: 9,000 hours. A. T. R. DC-3 desires position as executive pilot or with foreign airline. Two years college; two years Air Corps flight instructor, nine years as airline pilot, many years experience in South America, bilingual, passport, age 32, married. Immediately available, all offers considered. Write Box 797, AMERICAN AVIATION Magazine, 1025 Vermont Ave., N. W., Washington 5, D. C.

FOR COMPLETE MARKET REPORT of available multi-engine aircraft, including Beech, Convair, Curtiss, Douglas, Grumman and Lockheed manufacture, write or call
WILLIAM C. WOLD ASSOCIATES
516 Fifth Avenue, New York 18, N. Y.
Telephone: MUrray 7-2050

BOOKS FOUND! Free world-wide search service. Aviation history and literature a specialty. Fast service—reasonable prices. Send wants—no obligation. International Bookfinders, Box 3003-AA, Beverly-Hills, Calif.

Wanted: Experienced Radio Man to head Radio Department for large modification shop. Must have thorough knowledge of Collins and Bendix radio equipment, also Automatic Pilot installations. This is a well paid, permanent position for the right man. Box 798, AMERICAN AVIATION Magazine, 1025 Vermont Ave., N. W., Washington 5, D. C.

Need Representation in Ft. Worth-Dallas Area
Maintenance and Service Engineer, BS degree, A&E, and 15 years varied aviation experience, desires to represent you in sales-service engineering or technical matters.
Contact Box 799, American Aviation Publications, 1025 Vermont Avenue, N.W., Washington 5, D. C.

TRAVELING SALES REPRESENTATIVE. Airline sales experience preferred for interline sales. Contact "Zeke" Evans, Central Airlines, Inc., Meacham Field, Ft. Worth, Texas.

LOCKHEED PARTS
Lodestar—Connie
Fuselages - Wings - Nose Sections
Ailerons - Flaps - Rudders - Landing Gears - Wheels - Dem. Power Plant Units - Doors and other items as well as all component airframe parts.
Transport Aircraft—Engines—Airline Equipment
AIRLINE EQUIPMENT CORP.
Newark Airport, Newark, N.J.
MARKET 2-0963-4

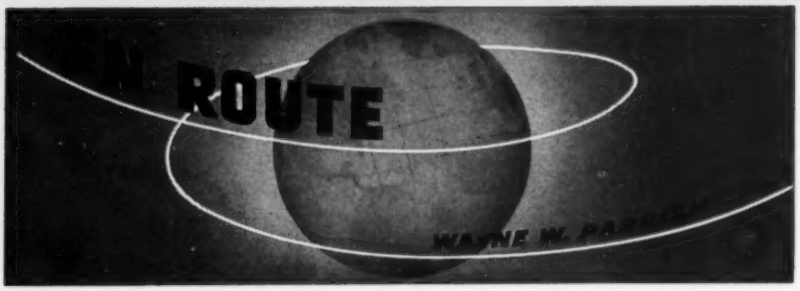
SENTINEL
Says:
"Insist on the Best
in Quality and Service"
BOSCH and SCINTILLA
magneto components
M-R-C
bearing distributors
SENTINEL AVIATION CORP.
512 North Pitt St.
Alexandria, Virginia

Wings Field Ambler, Pa. **WINGS, INC.** Phila. Intl. Airport
Aircraft Sales & Service Since 1929
Consult Us with Confidence before BUYING or SELLING any type aircraft
You Pay Nothing for Our EXPERIENCE and INTEGRITY
AMBLER 1800

TOOLS • PRATT & WHITNEY • TOOLS
Large Stocks
for
All Model Engines
Write for Catalog
MORCO TRADING CORPORATION
Office and Warehouse
8733 West Third Street
LOS ANGELES 48, CALIFORNIA
Cables: "Morco LosAngeles"

Advertisers Index

Aeroproducts Division, General Motors Corporation 85
Air Associates, Inc. 33
Aircraft Radio Corporation 58
Airwork Corporation 54
American Airlines, Inc. 40
American Magazine, The Crowell-Collier Pub. Co. 31
American Phenolic Corporation 80
Aviation Engineering Corporation .. 60
B G Corporation .... Second Cover
Barber-Colman Company 47
Beech Aircraft Corporation 56
Bendix Aviation Corporation Bendix Products Division Third Cover
Boeing Airplane Company 43
Boots Aircraft Nut Corporation 72
Bulletin Board 83
Canadair Limited 53
Chicago & Southern Air Lines, Inc. 67
Ciba Company, Inc. 70
Cities Service Oil Company 86
Consolidated Vultee Aircraft Corporation 19
Curtiss-Wright Corporation 5
Esso Export Corporation 38
Flightex Fabrics, Inc. 72
Grand Central Aircraft Company .. 64
B. F. Goodrich Company 10
Goodyear Tire & Rubber Company, Inc. 3
Greer Hydraulics, Inc. 79
Gulf Oil Corporation 62
Hertz Driv-Ur-Self System, Inc. 29
R. M. Hollingshead Corporation 37
Hotel Hollywood-Roosevelt 69
Joy Manufacturing Company 66
Hotel Lexington 69
Maryland Electronic Manufacturing Company 65
Monsanto Chemical Company 6
National Airlines, Inc. 57
Northrop Aircraft, Inc. 82
Pacific Northern Airlines, Inc. 67
Pratt & Whitney Aircraft Division, United Aircraft Corporation ...44, 45
Scott Aviation Corporation 81
S. C. Aeronautics Commission 61
Sperry Gyroscope Company 74
Texas Company, The .... Back Cover
Transport Equipment Company ... 9
Trans World Airlines, Inc. 35
United Air Lines 68
Universal Metal Products Company 73
Vickers, Incorporated 76
Westinghouse Electric Corporation 48, 49
Western Air Lines 59



Land to Spare. The time has come to let you in on the ground floor of the most formidable blue sky speculative real estate development that anyone has ever dreamed up.

One of my good friends is **Hjalmar Riiser-Larsen,** the famous Norwegian explorer and airman who now runs the Norwegian division of Scandinavian Airlines System at Oslo.

It was my good fortune to sit next to him at the plush dinner which Douglas Aircraft gave at Perino's in Los Angeles the night before we took off on the first SAS polar flight to Copenhagen November 19. It was my further good fortune to have him as my seat-mate for the entire polar flight.

Somewhere over the north polar regions we got to talking about his explorations and discoveries in the antarctic, and he commented that the area which he claimed was ten times as large as all of Norway.

New Subdivision. That got me to thinking. My friend Riiser-Larsen owns more of this earth's real estate than he can possibly use in his lifetime. He's a potentate. He's got land to throw away. He's got enough ice on top of his land (three miles thick) to fill all the cocktail glasses of the entire U. S. for decades to come.

So why not buy some of this land? Surely Riiser-Larsen isn't going to want to hog that big slice of the antarctic just for his own use.

So I asked him if he'd sell me, say, ten square miles, or maybe a hundred square miles. Sure, he said, why not? Knowing by his quick response that I had him in a buyer's market, since buyer's of South Pole real estate have been a little short lately, I threw out what I thought was a reasonable price for land hidden under three miles of ice. One dollar a square mile, I suggested, and Riiser-Larsen didn't seem to be upset at the price.

A Two-Pole Deal. So I was in business. Outside our DC-6 it was pitch dark but it didn't take much imagination to picture the vast wilderness of ice and snow below us as we flew on toward Thule in northwestern Greenland. Negotiating for South Pole property while flying near the North Pole was a new experience. I visualized sub-dividing my new-found real estate to friends at a handsome profit. I could offer building lots at one dollar each to all my friends, give them a handsomely-printed deed, and still come out okey.

Before leaving Riiser in Copenhagen, he going back to Oslo and I heading south to Germany, I reminded him of our deal and told him I'd be cooking up the details. Now I intend to proceed with the formal purchase and I'm taking orders for lots in this choice subdivision in the antarctic. Daylight 24 hours a day for three months each year. Better order fast while the choice locations are available.

I confess I can't give you an exact description at the moment except to tell you that the west side of my property, if anybody can figure out which way west is, borders on the 45th longitude East, and Riiser says he will sell me a choice area not far from the coastline.

Forget the Details. I'll have to be frank about it—this is where the blue sky speculation comes in—I can't quite identify my subdivision of Riiser's land on the map. Furthermore, it seems that the Australian government has assumed some sort of sovereignty over it and we sure have to clear that up. If I buy this land from a Norwegian who discovered it and the Australians claim sovereignty, I want to make sure that I, as a landholder, get proper rights (without taxation, I hope), and proper protection. I'm going to start screaming for roads, schools, and public utilities.

It was an idea of mine that Riiser might appoint me governor or something like that, and then I could dispense jobs and titles (all without pay) to my friends. I've always wanted a little kingdom of my own somewhere, as who doesn't. I'll keep you posted on the progress of negotiations; meantime better get your orders in. And positively no refunds, and don't ask for details, just yet, on how big those lots are.

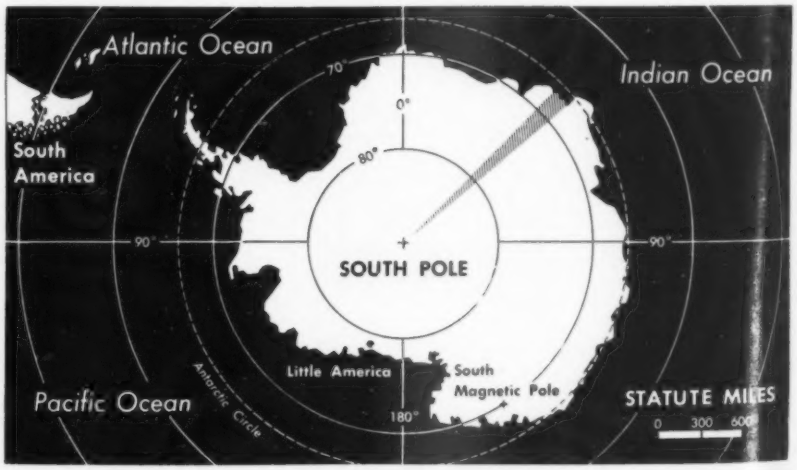
It May Melt. It's fascinating to listen to Riiser-Larsen talk about the two polar regions—north and south. He thinks that sometime hundreds of centuries ago the earth's axis must have been radically different. He has seen a complete tree trunk in the coal mines of Spitzbergen, evidence in itself that one day long ago there was ample vegetation on that northerly island now covered with ice and snow.

He says that if all the ice on the antarctic should melt at once, the level of the seven seas on the globe would rise 150 feet. You can imagine what would happen to New York's Manhattan Island! He thinks that if the ice cap should melt, the globe probably would go out of balance and turn around and that some place like Arizona might suddenly become the pole covered with ice. What a conjecture!

Maybe the flood of Noah's day, Riiser says, was caused by such a turnover of the globe at a time when Spitzbergen was a tropical country. It makes sense that the melting of vast layers of ice on the two poles could cause a complete shift of the axis and maybe such a thing is in process right now, since it is a fact that the polar ice is slowly melting. Suppose an atomic bomb should hasten the melting?

Money-Back Guarantee. We know the earth is at least 40 million years old. We know also that the story of the great flood of Noah's day was told and retold and handed down to us through the ages. So perhaps our descendants are in for another major shift a million or so years from now.

Anyway, it's a fascinating subject and you good people ought to appreciate my bargain in real estate at the antarctic. Guaranteed to have land under that ice or your money back. Some day when the ice melts and the north pole is now where Cuba is, you've got your future home site all bought and paid for—and at such a bargain price!



THE VAST AREA which Riiser-Larsen claimed as a result of his discovery is bounded by the 45th and 50th longitudes East and extends to the South Pole (shaded area, above).

Aeroproducts reports...

AEROPROPS KEEP GOING DESPITE SEVERE FLAK DAMAGE

OFFICIAL U. S. NAVY PHOTO

Lieutenant (jg) Robert C. Notz, USN, inspects the Aeroprop blade that brought him safely back from a North Korean target. Flying from fast carrier Task Force 77, Lt. Notz' AD fighter-bomber was hit by Red flak during a low level attack. A bite approximately 18 inches long was taken out of the trailing edge of the blade deep into the rib section. The blade remained intact and enabled him to reach a repair base. A new Aeroprop blade was installed without removing the propeller and the ship was returned immediately to combat.

OFFICIAL U. S. NAVY PHOTO

Now Lieutenant Commander Lynn DuTemple knows why his AD *Skymaster* raised such a howl when he brought it aboard the USS *Princeton* off Korea. A 37mm enemy anti-aircraft shell had torn a gaping hole completely through one blade of his Aeroprop. LCdr DuTemple had just completed his fourth bombing run on Hamhung railroad bridge when the flak ripped through his prop blade and shattered his canopy. The pierced Aeroprop blade did not alter its performance enough to reveal the damage until the plane had reached its carrier base.

THESE INSTANCES OF COMBAT DAMAGE EXEMPLIFY THE DURABILITY OF AEROPROPS . . . THE METICULOUS ENGINEERING AND CAREFUL FABRICATION OF ALL AEROPRODUCTS PROPELLER EQUIPMENT. THIS SAME SERVICE . . . AND THE "VISIONEERING" FOR AIRCRAFT OF THE FUTURE . . . ARE AVAILABLE TO ASSIST YOU WITH ANY PROPELLER PROBLEM IN THE SUBSONIC, TRANSONIC OR SUPERSONIC RANGES.

GM GENERAL MOTORS

Building for today... Designing for tomorrow

Aeroproducts

ALLISON DIVISION • GENERAL MOTORS CORPORATION • DAYTON, OHIO

SOUTHERN AIRWAYS AT ATLANTA, GEORGIA. Popular service stop-over for many industrial, executive, corporation and personal planes heading for Florida from Midwest and Northwest.

Popular, Dependable Service-Point For Many Florida-Bound Aircraft

ARMY FIELD FORCES SCHOOL at Southern Airways, Atlanta, teaches instrument flight training to Army Aviators of 3rd Army, Fort McPherson, Georgia.

CITIES SERVICE
AVIATION PRODUCTS

Southern Airways at Atlanta And Birmingham Services More Businessmen's Aircraft Than Any Other Fixed Base Operation In Southeast! . . . With Cities Service Aviation Products!

Here's another spot on the airmap of America where a top-flight aircraft service organization relies on the consistent high quality and ultra-dependability of Cities Service Aviation Products.

Southern Airways service facilities include Radio Shops and approved CAA Repair Stations. They are also the leading distributors in dollar volume of Beech Aircraft and parts.

Wherever you fly through the Southeast, make Southern Airways your service stop. You'll always be assured of the highest quality service with America's finest Aviation Products . . . the complete line of Cities Service Aviation Products.

News at Deadline

Two DC-6B's Ordered By Non-Scheduled Carrier

What is believed to be the first order for new post war transports by an irregular operator has been placed by North American Aircoach Systems, Burbank, Cal. NAAS Executive Vice President James Fischgrund said two Douglas DC-6B's, especially designed for coach operations, have been ordered from Douglas Aircraft Co. The planes will be fitted with rearward-facing seats, which will make it the first non-military U.S. transport so equipped.

U.S. to Certificate Jets Individually

Results of the visit to the U. S. by representatives of the British Air Registration Board to discuss jetliner certification included "U. S. willingness to consider acceptance of specific British-designed and manufactured turbine powered aircraft [for certification] on an individual basis," according to CAA Administrator Charles F. Horne.

The talks also produced some British dissatisfaction with the American attitude, which apparently involves making such modifications in the Comet as the installation of an emergency oxygen system for all passengers.

Procedure in arranging U. S. certification "on an individual basis" would involve assurance from the ARB that the airplane meets certain standards; receipt of further information about aspects of the airplane not covered by those standards; and examination of one of the airplanes by U. S. technicians.

Military Orders for Convair 340 Predicted

Military production orders for the Convair 340 may be expected, it is indicated by the firm's annual report. Board chairman Floyd B. Odlum stated in the report that such orders "in a slightly different version, seem assured." Odlum also appeared optimistic about the prospect of production orders for the F2Y hydro-ski seaplane.

Deliveries of Convair 340's reached a new high during January, when 10 of the aircraft were delivered. Convair thus surpassed its new production schedule, which had called for an increase from six to eight.

CAB Asks Cease and Desist Order for UAL

CAB's office of enforcement has started a proceeding against United Air Lines in the DC-4 coach fight (see page 21). Enforcement Chief Oliver Carter docketed a complaint against the line requesting a "cease and desist" order to "compel compliance" with provisions of the Civil Aeronautics Act.

Under CAB procedure, United has 15 days to answer the complaint, or until February 21. Following this, hearings before CAB are in order prior to issuance of the "cease and desist" order. Such orders by CAB are considered equivalent to civil court injunctions.

The enforcement complaint charges United with violations of four sections of the Act, including Sec. 411 which deals with "unfair or deceptive practices or methods of competition . . . ." The complaint alleged United will "continue to violate the Act . . . unless and until it is required by the Board to cease and desist . . ."

Since November 22, United has been limiting DC-4 coach flights to 54 seats for "safety reasons." Its tariff, which CAB will not permit to be changed, specifies a 64-seat minimum for coach fares.

Talbott Approved

Senate confirmation of Harold E. Talbott as Secretary of the Air Force has come as the last of the approvals necessary for President Eisenhower's high command in the Defense Department. Vote on Talbott was 76 to 6.

DPA Abolished; First Step in Series

The Defense Production Administration has been abolished as a separate organization, and has been incorporated into ODM under acting Defense Mobilizer Arthur S. Flemming. The move came in the form of an executive order from the President, "the first step in a series . . . calculated to strengthen central direction."

Flemming was also told to take over the National Security Resources Board on an interim basis, although there is reportedly no plan to abolish the NSRB.

NWA Warns State Taxes May Drive It Away

The State of Minnesota has been warned in a blunt speech by Harold R. Harris, president of Northwest Airlines, that the carrier may move its headquarters elsewhere unless it is given some form of tax relief.

State and local taxes paid by NWA in Minnesota come to 63% of the system total, while only 16% of the total passenger revenue originates in Minnesota, Harris told the Minneapolis Chamber of Commerce. Harris said he was not "a tax economist or a tax expert. I look at taxes from the businessman's viewpoint. What do they cost—and is it cheaper some place else?"

Air Associate President

J. E. Ashman has been elected president and a director of Air Associates, Inc. He will administer the firm's program of product diversification and market expansion.

Olympus Jets In Vulcan

Four Bristol Olympus jets will power production models of the Avro Vulcan delta bomber, rather than the Rolls-Royce Avons which power the prototype. Current rating of the Olympus is understood to be well above the 10,000 pound thrust mark; the Rolls-Royce RA7 has been type-tested at 7,500 pounds static thrust.

New Jets in Korea

The Lockheed F-94B and the Douglas F3D Skyknight are now in service in Korea. The latter, being used by the Marine Corps, is the latest jet to see combat.

Convair Coaches Proposed by Delta

A proposal that Convair 340's be used in coach service has been made by Delta Air Lines. Delta will use the Convairs for off-peak service between Atlanta and Dallas starting March 1 if CAB approval is obtained. Fares would be $30.90, compared to the regular price of $50.40.

Pacific Jets Delayed

Trans-Pacific jet service will be delayed until April 28, at which time Canadian Pacific Air Lines will receive its two de Havilland Comet IA's.

ALPA Hits Govt. Strike Reimbursements

The Federal government should not underwrite airline losses incurred as a result of labor strikes, in the opinion of Clarence N. Sayen, president of the Airline Pilots Association. Sayen protested specifically against claims made by Pan American, on behalf of American Overseas Airlines, for losses sustained during the 1947 AOA pilot's strike.

Sayen argued that if CAB made allowance for such losses in calculating mail pay, "the Board [would throw] the weight of our Federal Treasury into the fray on the side of the company."

White Named to USAF

H. Lee White, a New York lawyer, has been nominated and approved as Assistant Secretary of the Air Force by President Eisenhower. White will succeed James T. Hill.

Local Service Surveyed In Minnesota

The prospects for local service are good in Minnesota, concludes a survey conducted by two professors at the University of Minnesota. A good many citizens use local service lines as "taxi service" to Wold-Chamberlain Airport in the Twin Cities, the report says, and describes this as "a reasonable pattern."

Some two million Minnesotans live outside the Twin Cities area, from which transcontinental flights take off and are thus potential customers for local service carriers.

Light Planes Larger; So are Sales in '52

Among lightplane manufacturers dollar volume and number of aircraft both rose during 1952. During the year 32.8% more aircraft were delivered (3,058), and they were worth 54.9% more than those shipped in 1951 ($26,159,000).

Apparent was a trend toward sale of larger planes. In 1946, the year of a postwar boom, 90% of the output was in one- or two-place aircraft. In 1952, over 82% of the planes were four-place or larger types.

Onestop London—Tokyo Service Planned by BOAC

Onestop service between London and Tokyo is planned by BOAC, via Edmonton, Alberta. Turboprop-powered Britannias will make the 16-hour flight in 1955, according to BOAC board chairman Sir Miles Thomas.

Tourist flights between London and Johannesburg, which begin this fall with BOAC Connies, will also switch over to Britannias in 1955.

ATA 'Copter Groups Outlines Program

Newly elected chairman of the Air Transport Association helicopter committee for 1953 is Charles Froesch, vice president-engineering for Eastern Air Lines. The committee has adopted a six-point program which would:

- **Define markets** and determine traffic potential for helicopter operations;
- **Analyze** present and proposed designs and determine how they would fit the markets;
- **Develop** specifications for recommendation;
- **Outline** desirable heliport characteristics;
- **Encourage** favorable government policies.

Name Advertising Head

James W. Austin, vice president-traffic and sales of Capital Airlines, has been named to head the ATA committee on advertising for 1953. A sub-committee on advertising and promotion of air mail, air parcel post, and military traffic has been appointed.

Small Airports Continue Decline

The number of airports continues to drop. The trend, which began several years ago, is reflected in CAA figures which show only 6,022 civil airports at the end of 1952, as compared with 6,237 at the end of the preceding year.

Most of the loss was in the smaller fields (Class III and smaller), while increase in the Class VI or larger ones was roughly cancelled by a drop in Class V.

Hiller Resignations

Management changes at Hiller Helicopters include the resignation of Frank A. Learman, as executive vice president, and resignation of both Learman and I. M. Laddon from the board of directors. Also resigning is Frank Watson, vice president of contracts.

NACA Center Started

New NACA high speed flight research center is now under construction on the Mojave Desert between Randsberg and Mojave, California. Project, which will cost $3.8 million, includes a laboratory, hangars, electronics test facilities, and a preflight center for rocket engine testing.

Tigers Buy C-46's; New Take-Off Weights

Fifteen of the C-46's which were recently brought back from Hong Kong by Civil Air Transport have been bought from the carrier by The Flying Tiger Line. Two of CAT's Convair 240's have also been purchased by a European line, leaving CAT with 54 aircraft for sale, mainly C-47's and C-46's.

New take-off performance rules which will affect cargo-carrying C-46's went into effect February 15, as a supplement to Civil Air Regulations Part 42. Some reduction in gross weight will consequently be necessary for the aircraft at fields with short runways and located at high altitudes, according to CAA.

Canada to Drop Original Designs

Canada will have no more original military designs, if the Canadian government puts its new policy into effect. The high cost of the Avro-Canada CF-100 has turned Canadian officials against original development and has put them in favor of a national policy of building U. S. and British aircraft under license. The decision will not affect commercial designs.

Boutelle Receives Patent Award

A royalty award has been granted to Richard S. Boutelle, president of Fairchild Engine and Airplane Corp., for a patent issued last July, following an arbitration proceeding held by the Manufacturers Aircraft Association. Boutelle's patent covers a means of using a combination of exhaust gases and rammed air to improve cooling and increase thrust in reciprocating engines.

NEW

CERAMETALLIC Brake Lining

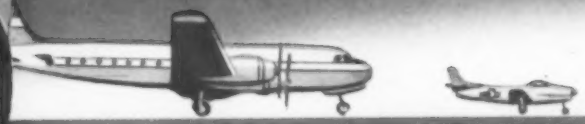
Gives

- Fifty per cent greater brake capacity
- Five times longer lining life
- Delining and relining in half the time

The ever increasing landing speeds and greater gross weights of airplanes produce extremely high brake temperatures and rapid lining wear that call for a new approach to the problem of heat resistance and wear resistance in brake linings.

Bendix engineers have produced an entirely new type of brake lining that not only resists high temperatures far above the working limits of any conventional friction material, but that actually wears five to seven times longer.

This remarkable lining, known as CERAMETALLIC brake lining, is fundamentally different in that it contains no resin or other organic substance; the base is a ceramic material combined with other ingredients to give long wear and good friction properties.



IMPORTANT ADVANTAGES

Increased brake capacity . . . no fading . . . no grabbing . . . maintains original friction throughout lining life . . . runs cooler because of better heat conductivity and better ventilation . . . less dust, better scavenging . . . no run-in period needed . . . wears five to seven times longer . . . fewer brake adjustments . . . less wear on brake rotors . . . easier, faster delining and relining.

Send for folder containing complete details.

LEADER IN LANDING GEAR

FIRST IN FUEL METERING

Bendix Products Division

BENDIX • PRODUCTS DIVISION • **SOUTH BEND**

AVIATION CORPORATION

Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, N. Y.

WHY WESTERN AIR LINES CHOSE TEXACO

...to lubricate its great, new DC-6B fleet

WESTERN AIR LINES has been using *Texaco Aircraft Engine Oil* exclusively for years. Western knows *from actual performance* what a great job this great oil does — in keeping engines running dependably, in keeping maintenance costs low.

Therefore it was only natural that Western chose *Texaco Aircraft Engine Oil* for its new DC-6B super-luxury fleet.

Texaco Aircraft Engine Oil is first choice for engine lubrication throughout the aviation industry. In fact—

For over 15 years, more revenue airline miles in the U. S. have been flown with Texaco Aircraft Engine Oil than with any other brand.

Let Texaco Lubrication Engineering Service help you step up the efficiency of your operation. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, *Aviation Division,* 135 East 42nd Street, New York 17, N. Y.

INAUGURATION of de luxe DC-6B service on Western Air Lines' Pacific Coast routes, and inauguration next month of DC-6B flights over Western's new route between Minnesota and California, mark two more great advances by America's oldest airline. Texaco congratulates Western Air Lines on its achievements, and is proud that engines of *all* Western's planes are lubricated exclusively with *Texaco Aircraft Engine Oil.*

TEXACO

TEXACO Lubricants and Fuels

FOR THE AVIATION INDUSTRY

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE, on television Tuesday nights. METROPOLITAN OPERA radio broadcasts Saturday afternoons.